The Builder.

VOL. LXI. No. 2336. SATURDAY, SEPTEMBER 12, 1891.

ILLUSTRATIONS.

Sculpture: "À la Terre."—M. A. Boucher, Sculptor ..... *Double-Page Ink-Photo.*
New Premises, Chester.—Mr. T. M. Lockwood, F.R.I.B.A., Architect ..... *Double-Page Ink-Photo.*
New House, Palace Court.—Mr. W. Flockhart, Architect ..... *Double-Page Photo-Litho.*
South Kensington Museum Competition: Interior of Central Hall.—Design submitted by Messrs. Deane & Son ..... *Double-Page Photo-Litho.*

Blocks in Text.

Old Houses in Fleet-street ..... Page 201
Plan of House at Palace Court ..... Page 208.
Four Cottages at Maidstone ..... Page 207

CONTENTS.

The Southampton Free Library Competition 199
Economics of Iron and Steel 200
Notes 200
Letter from Paris 202
Archæologists in Ireland: The Cambrian Archæological Association at Killarney, Tralee, and Dingle 203
Seventh International Congress of Hygiene and Demography .. 206
Four Cottages at Maidstone 207
Sculpture: "A la Terre" 208
New Premises, Chester 208
New House, Palace Court 208
outh Kensington Museum Competition 208
Competitions 208
The Trades Union Congress 209
Municipal Engineering 210
Magazines and Reviews 210
Books: "The Stonemason and the Bricklayer" (London, New York, and Melbourne: Ward, Lock, & Co.) R. H. Reeves' "Sewer Ventilation and Sewage Treatment" (London: Sinclair, Tweedie, & Co.); G. G. M. Hardingham's "Patents for Inventions and How to Procure Them" (London: Crosby Lockwood & Son.) 212
The Family of Sir C. Wren 213
"English Architects in Australia' 213
Safety of Factory Employés in Case of Fire 213
A Death-Trap 214
"Rushes as a Key for Plastering" 214
Stable Drainage 214
The Student's Column.—Marbles, XI. 214
Sanitary and Engineering News 215
General Building News 215
Foreign and Colonial 215
Miscellaneous 216
Recent Patents 216
Some Recent Sales of Property 217
Prices Current Materials 217

The Southampton Free Library Competition.

THE award in this competition was published on Monday afternoon last, and the drawings were exhibited for some hours on that day, and from 10 a.m. to 10 p.m. on Tuesday in the Art Society's Rooms, Marsland-place.

The Assessor, Mr. Henman, of Birmingham, has awarded the first place to Mr. Albert E. J. Guy, of Albert-road, Southsea, Portsmouth, and the second to Mr. S. R. J. Smith, of York Buildings, Adelphi. The conditions offer first and second premiums of 50*l.* and 25*l.*; they are fairly concise in the statement of the accommodation required, which includes Lending Library, Reading, News, Store, Caretaker's Rooms and Librarian's Office; also a Reference Library and Book-mending and Store-rooms. The cost is limited to 3,500*l.*, exclusive of bookcases and fittings.

The site is a corner one, somewhat resembling a triangle in shape, at the end of the High-street. It overlooks Andrews and Watts Parks, and faces London-road and Cumberland-place with a circular frontage. This site is a commanding one, and offered great opportunities to those competitors who know how to take advantage of them. The advertisement of this competition was responded to by the submission of no fewer than thirty-seven complete sets of designs.

Mr. Guy places his principal entrance at the junction of Cumberland-place and London-road. A porch leads into a hall, with lavatory accommodation on each side; and the staircase to the first floor is on the right-hand. On the left of the hall a Reading-room is placed, and on the right the News-room. Opposite the hall, and with its axis in continuation of that of the hall, is the Lending Library, top-lighted. On the right of the Lending Library is the Reference Library, which is continued at an angle partly behind the Lending Library, being top-lighted in each case. The counter of the Lending Library is opposite the hall, and forms an inner hall, from which the Reading-room and News-rooms are reached. The angle formed by the Lending Library and Reading-room, facing Bedford-road, is occupied by an entrance for the staff, and a circular staircase to the upper floor, also a Book-mending room and a Store-room, with an alternative suggestion of a ladies' Reading-room. The cellar-plan shows two Store-rooms. The first-floor plan is devoted to the upper parts of Lending Library, with gallery round, the upper part of the Reference Library, with similar gallery, upper part of Reference Library, and News-room. The Librarian's Room is placed on this floor over the inner hall, with a top light, and is so arranged that the windows in the upper parts overlook the Lending Library, News-room, and Reference Library. However ingenious and convenient for supervision this arrangement may be, it is hardly as convenient for administration, and the counter of the Lending Library, which probably will require the most supervision, will receive none, for it is immediately beneath the Librarian's room. The Committee Room over the front hall is certainly conveniently placed near the Librarian's Room, but it is a badly-shaped room to accommodate ten persons; and the heating, unless artificial means are resorted to, will be distinctly bad. Lavatory accommodation has been provided for readers of both sexes on the ground-floor, but experience has proved in many cases that it is misused, and thus becomes a nuisance to the building. The elevations are tame to a degree, and are treated in a style that has not hitherto been considered worthy of a name; they are sketched in in charcoal or chalk. The central portion over the hall is carried up and accommodates a tank above the Committee-room, and is then terminated in a turret. The elevations to Cumberland-place and London-road are each emphasised by pediment terminations to two bay-windows, but the other elevation has no distinction of any sort.

Mr. S. R. J. Smith, to whom the second premium has been awarded, has had some experience in free library work. Mr. Smith cannot be congratulated on the method he proposed to adopt of putting his building on the site. His entrance is placed in London-road, but the whole of this frontage to a curved line is broken up by angles which would not have a good effect in execution. The entrance is through a square porch, with a tower on the left containing a circular staircase to the first floor, and leads into a vestibule, which has on its left the Librarian's room, which overlooks the Lending Library facing Cumberland-place and the borrowers' lobby. On the opposite side of the vestibule is placed the News-room, overlooking London-road. Passing through the vestibule, an inner hall, top-lighted, is reached, with borrowers' lobby and Lending Library on the left, with Reading-room opposite, and Reference Library, facing Bedford-road. The Reference Library is entirely top-lighted, and is in a quiet position. It has a gallery around, and a space reserved for librarian, but this arrangement seems hardly compatible with economical administration, and would be better placed in greater proximity to the Lending Library. The Reading-room adjacent is top-lighted, and has one window facing Bedford-road. The staircase referred to leads to a heating chamber and staff lavatory in the basement, and a committee-room and caretaker's apartments on the first floor. A book store and a book-mending room are provided under a portion of the Reference Library. The elevations are simply treated, and would have been much more pleasing had a little more attention been paid to the proportions of the parts.

The unpremiated designs are so numerous, and with one or two exceptions of such a mediocre character, that little good can be done by referring to them. Reference must be made, however, to a very excellent design submitted by Mr. H. T. Hare, who has the distinction of being the author of the best elevation in the exhibition. The elevation is that of a building which would have been a credit to the town,—a remark that cannot be applied to the selected design. The plan, as it at present appears, is wanting in one or two slight particulars, the most noticeable being that the Reference Library is entered by passing through the Reading-room. This might, however, have been easily altered without injury of any sort to any other department. A special point, and a good one, is the position of the librarian's room on the ground floor,—a much better position than that given it by Mr. Guy on the first floor. The assessor appears to have condemned it partly on account of the rooms being of bad shape, but careful comparison shows that the shape of Mr. Hare's rooms are better than those of Mr. Guy. Mr. Hare

places the entrance, Reading-room, and News-room in similar positions to that adopted by Mr. Guy, and the Lending Library corresponds, except that the axis is at an angle, instead of in line, with that of the entrance-hall, and is parallel to Bedford-place. The Lending Library is undoubtedly of irregular shape; but this is of less consequence in a room that is broken up by book-presses, and not continually occupied by the public. The first floor is occupied by spacious caretaker's apartments and a Committee-room of good proportions. Lavatory accommodation is given on each side of the entrance for readers of both sexes. The elevation is well treated in red brick and terra-cotta; it looks exceedingly well extended, and at the angle required by the site would doubtless look much better than any of the others. The elevations are treated in that phase of the Renaissance in which the author excels. The principal entrance has above a projecting bay of the Committee room, with a gable above, a lantern being placed at the junction of this and the main ridge. Two small gables immediately flank the central one, and piers, which develop into graceful turrets, mark the angles. The elevations to the News and Reading Rooms at an angle to the last, have a central bay, with a gable and turret on the ridge above.

It is impossible to agree with the award in this competition, and it is to be regretted that Mr. Hare's designs have not been awarded the first place. Mr. Guy's designs will require modification in elevation and in plan previous to execution; whilst Mr. Hare's plan, with less modifications, would show a building which would grace the important position it was intended to occupy.

ECONOMICS OF IRON AND STEEL.

SUCH extensive use is now made of iron and steel for structural purposes, that a considerable knowledge not only of what can be manufactured and readily obtained, but also of the leading principles and practices of the industry, is becoming more and more necessary to the engineer and architect who have to use these materials. A brief examination of the average specifications relating to iron and steel work is sufficient to show that much greater uniformity might be observed in the requirements of engineers regarding the quality of the material they demand for various purposes; and the designs for structural work in many cases exhibit so many different forms and sizes of rolled sections, that much delay and extra expense is caused by the difficulty of obtaining such from the manufacturers within a reasonable time.

Mr. H. J. Skelton, in his book on the "Economics of Iron and Steel,"* has "attempted to make clear the best every-day practice in the heavy iron and steel trades, to those whose province it is to deal with the material after it is made." It is not therefore a book for the manufacturer, but for those who are responsible for the proper application of the materials. From the first page to the last the subject has been treated in a clear and workmanlike manner, and we know of no book that could be studied with greater advantage by those who use, or are interested in, the products of the iron and steel industry.

The work is naturally divided into three parts. "Cast-iron," "wrought-iron," and "steel." The manufacture of each, and the forms in which it can be obtained, are described, and the most approved tests which each material should stand to ensure it being of a suitable quality for the purpose for which it is intended, are also given at some length, and form a useful portion of the book. Since it is now possible by the "basic" process to utilise phosphoric pig-iron, nearly one-half of the crude iron produced in Great Britain is converted into steel, and excellent material can now be made from metal taken direct from the blast-furnace to the Bessemer converter. Of the pig-iron now made only a small quantity is produced by what is known as the "cold blast," as the greatly-increased price of material made in this way prevents its being used except where its superior quality renders it necessary.

The ordinary test for cast-iron which is to be used for structural purposes is, that a specimen bar of the material 2 in. deep, 1 in. wide, and 3 ft. 6 in. long, placed on bearings 3 ft. apart, should withstand a load of from 25 cwt. to 30 cwt. applied at its centre, before breaking. Such a test however does not insure the metal being sufficiently ductile for many uses, and we quite agree with the author, that better cast-iron is secured if it is specified that the above test bar must deflect not less than from $\frac{1}{4}$ in. to $\frac{1}{3}$ in. before fracture. Specimen bars should also be tested that have a thickness equal to the thickest part of the casting, the quality of which they are intended to exhibit.

In dealing with wrought-iron the author first describes what is known as "best Yorkshire"; which is the best possible iron that can be obtained, being made from a superior quality of cold blast pig-iron, and a fuel practically free from sulphur. Lowmoor and Bowling iron are examples of best Yorkshire iron, but there are other brands which denote qualities of equal excellence. Material of this class is used in the boilers of locomotives and other engines, in the couplings used on railways, and generally where sudden stress may be expected, and when any failure might be attended with disastrous consequences. Other qualities of iron are made in Staffordshire, Shropshire, and other counties, but it is wiser to specify the tests that the material will be required to stand, than to name the locality from which it is to be procured.

In dealing with the tests for wrought-iron, the author lays great stress upon the necessity of specifying what amount the reduction of area at the point of fracture of the test piece should be, as well as what elongation is required, in addition to tensional strength; and he also points out that the appearance of the fracture of a piece of iron must not be taken as too sure a guide to its quality, since it is quite possible to make a bar of excellent material show a crystalline fracture, due entirely to the manner in which it has been broken.

One-half of the book has been devoted to a description of steel, and the Bessemer and open-hearth processes, in which pure pig-iron is used, are explained, as well as the "basic" method, which permits phosphoric pig being utilised. To the uninitiated the distinction between wrought-iron and steel is not very evident when the chemical constitution is alone considered; but when it is remembered that wrought-iron is produced by welding together a number of small pieces, which have never been thoroughly fused, while mild steel has been completely melted before being cast into ingots, the difference between the two materials is easily realised.

In dealing with mild steel greater care must be exercised than is necessary in the case of wrought-iron. As stated by the author, all sheared edges of plates should be afterwards planed, and all holes should be drilled. In some cases, however, when the thickness of the material does not exceed three-eighths of an inch, we think punching might be allowed, although it should never be permitted in thick plates. In designing structures in iron and steel, it must not be forgotten that while the cost of the steel may be somewhat greater than that of iron, and that extra expense is incurred through the more careful treatment necessary in the workshop, yet these outlays may be more than counterbalanced by the reduction that may be effected in the weight of the structure, owing to the increased stress per square inch that is allowable, as well as by the much larger sizes of the plates and rolled sections that can be obtained in steel.

It is essential, when specifying the quality of steel required for structural work, not only to state the least strength per square inch that the material must have, but to require also that its strength shall not exceed a certain limit. The range allowed between this maximum and minimum strength is generally from three to five tons.

The author adds considerably to the value of his work by giving a comprehensive list of those tests which are at the present day recognised as the best that can be applied to steel to secure a quality that is suitable for the purpose for which it is to be used, and he also gives many useful tables showing the sizes of rolled sections and plates that can be ordinarily obtained, and the extra price it is necessary to pay if these limits are exceeded.

In conclusion, we have confidence in recommending this work to engineers and architects, who will find it contains much that will be useful in every-day practice, as well as being a book which gives a clear and able description of the modern iron and steel industry.

* "The Economics of Iron and Steel." By H. J. Skelton. London: Briggs & Co., Salisbury-court.

NOTES.

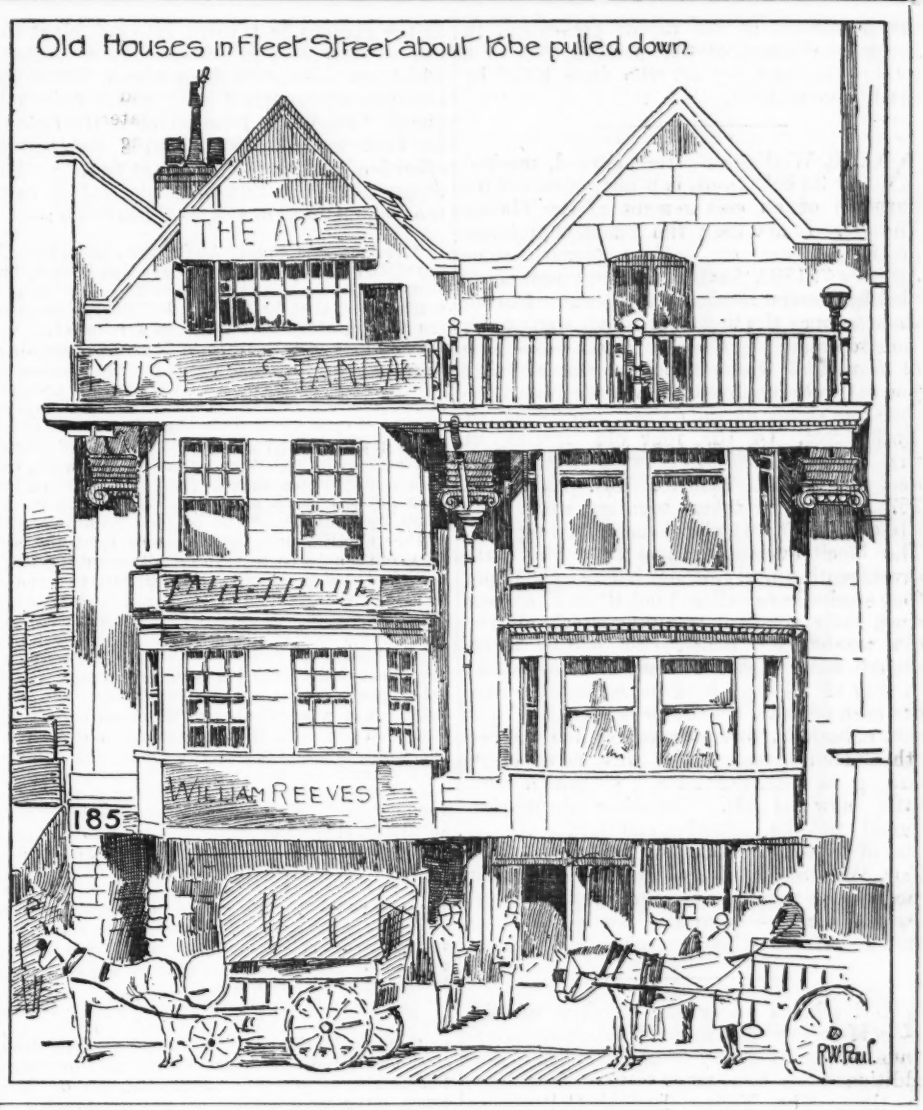
THE report of the Parliamentary Committee of the Trade Union Congress, presented to and read at the opening meeting on Monday, is in its way an interesting and significant piece of reading. The Committee are triumphant over Mr. Bompas, the Recorder of Plymouth, who in the case of "Curran *v.* Treleaven" ruled that a strike for the purpose of raising wages or altering the conditions of employment was lawful unless it was accompanied by violence or intimidation, but a strike for the purpose of compelling employers not to employ other persons or to alter the terms of employment of such other persons was illegal. "Such an interpretation of the law," says the report, "would render it impossible at times for workmen to dispose of their labour with freedom and upon conditions satisfactory to themselves, as the influence of 'such other persons' as those to whom Mr. Bompas refers is often the sole or principal reason why unionists are unable to raise their wages or alter the conditions of their employment. Happily there has been obtained from a superior court—though not without considerable expense—a more rational and just interpretation of the law, and one which, it is hoped, will check any further tendency to strain it for the purpose of injuring trade unionists." The real meaning of this sentence is only seen by comparison with a further passage in the Report, in which we read that "in Gibson *v.* Lawson" it was decided that "to tell a workman that if he does not join a certain society his fellow-workmen who are members of that society will strike is not intimidation. (In this case the resolution to strike was communicated to the employer, who, thereupon, dismissed the workman in order to avoid a strike.)" There could hardly be a more cynical illustration of that *reductio ad absurdum* of universal liberty,—"It is a free country, and the majority will not allow it." The judgment of Mr. Bompas, it is said, would leave it "impossible at times for workmen to dispose of their labour with freedom," unless they can combine to procure the dismissal of another man who does not agree with them. Most people, we imagine, would think that it was the unfortunate man thus driven from his work by the tyranny of a majority who found it "impossible to dispose of his labour with freedom." However, on the legal point we are inclined to believe that the Recorder of Plymouth was mistaken, and that as a matter of law there can be nothing to prevent any collection of men from saying they will not work unless a man who does not belong to their union is dismissed and prevented from earning his living. It is a pity that trades-union men cannot learn that there are unwritten laws, sometimes of more importance than written ones. We fear it is no use telling them that such an action as they here pride themselves on would be considered by all honourable and

high-minded men as mean and contemptible; that a healthy-minded average English schoolboy would probably characterise those who carried it out as "a parcel of sneaks." The artisan classes are very fond now of the theory of universal social equality—"one man is as good as another," and so on: a perfectly tenable proposition in theory, no doubt. We will allow it to them in practice when they show themselves actuated by the same rules of conduct which govern the actions of true "gentlemen" all the world over: then, and not before.

THE fact that wheat is higher in price than it has been for the last eight years, and that the price of bread has consequently risen, has brought joy to the heart of the farmer. It will not be regarded with equal satisfaction, either by the agricultural labourer, who gets no rise of wages from his employer, or by the operatives of the towns. There is every appearance that the price of wheat will continue at a higher level during the winter than we have been lately accustomed to see it. Even a slight increase in the price continued throughout the winter means a greater strain on the resources of the artisans throughout the country. It is, therefore, to be hoped that the leaders of the working men will not carry the bulk of those who trust in their counsels hastily into strikes and trade disputes in the months that are before us. A winter of peace in the relations between capital and labour will largely counterbalance the rise in the price of bread, and will perhaps place masters and men on a better footing with each other for an appreciable time.

THE London and North-Western Railway Company have just set an example which, if generally followed, would remove an old-standing travellers' grievance. We allude to the late appearance of time-tables, which is a frequent cause of inconvenience and annoyance. The North-Western proofs are generally in the hands of the time-table publishers in good time, but the first proof of the October issue was actually sent out last Saturday. There are several blank pages, but the principal services are complete, and the additional particulars will shortly follow. It would be a positive boon to the travelling public if time-tables and guides were procurable a day or two before the first of the month, instead of,—as is often the case,—a day or two after. But to ensure this it is, of course, essential that the necessary information should be promptly furnished by all the companies. A single defaulter may be,—and doubtless often is,—the sole cause of the delay.

A CORRESPONDENCE in the *Times* deals once more with the ever-recurring question of the share which the Electric Lighting Act of 1882 has had in retarding the progress of the industry. Few, if any, would urge that Mr. Chamberlain's Act of 1882 did not seriously interfere with the raising of capital for the purpose of lighting by electricity on an extended scale. Yet there are those who ignore this fact when considering the sudden check which electric lighting received at this juncture, and profess to believe "it was due, in the first instance, to the fact that the generating machinery and the distributing methods known to English electricians at that time were immature, and experimentally altogether unequal to the task of an efficient general supply of electricity." Mr. Crompton's able letter easily disposes of the contention that "the generating machinery" was "unequal to the task." There were, unquestionably, difficulties of distribution, but these could not be anticipated by mere laboratory experiments. They have been discovered and overcome by the supply companies, which commenced operations immediately after the passing of the Amending Act of 1888, and no one has yet shown that this could not have been done just as well six years earlier. Mr. Crompton, than whom no one is more competent to speak, states that the Westminster Supply Corporation is using essentially the same designs as those drawn up by him in 1883; further, that the same gentleman who eventually found the capital for the central stations at Kensington, would have found it "at the earlier date if the 1882 Act had given the forty-two years' tenure to the lighting supply companies." Unless Mr. Crompton's memory has curiously misled him, his statements give a conclusive and final answer to the question.



THE end of the civil war in Chili, and the settlement of the negotiations as to the loan to Uruguay, though primarily chiefly of interest to the people of the respective countries, are of a good deal of importance to many people in this country. When civil war was being carried on on the Western shores of South America, and a State was under the shadow of impending bankruptcy on the other, public works and building and engineering enterprises of all kinds necessarily came to a standstill. With the two events which have now taken place in Chili and Uruguay it is probable that a resumption of national works will occur. There is no more profitable field for the young engineer than these States, and now that all parts of the world are so closely united, peace and prosperity in the distant Republics of South America are important to all sorts of people in Great Britain.

THE premises numbered 184-5, between St. Dunstan's-in-the-West and Fetter-lane, Fleet-street, will shortly be pulled down, being in a somewhat unstable condition. They narrowly escaped from the Great Fire, which stopped just at the corner of Fetter-lane, and even then had been standing for longer than 100 years; as also from a conflagration in 1730. Aubrey tells us that Drayton, who dedicated his "Polyolbion" to the Prince Henry who was a patron of Chapman in his translation of Homer, lived at the house next the east-end of St. Dunstan's Church, that is, we gather, at No. 185. The houses, built of red brick, and with one gable a-piece, at the rear, are interesting specimens of Tudor domestic architecture, and probably form the sole survival of Fleet-street as it was before the Fire. The front of No. 184 was slightly modernised within the last ten years or so by the insertion of a window in place of a doorway in the top-story, and the removal of the former casements from the windows in the bay; the ornamental balcony railing of No. 185 is now concealed by a fascia-board. The gateway under No. 185 leads into a court formerly known by the sign of the "Hen and Chickens." Drayton's house must have been familiar to another poet, Abraham Cowley, who was born, a posthumous child, in Fleet-street, near to Chancery-lane. Also to Izaak Walton, who, in 1624, quitted his little shop over the Bourse, or Royal Exchange, Cornhill, to share with John Mason, hosier, a house (adjoining the "Harrow Inn") which, at its demolition in 1881-2, was No. 193, Kenning's Masonic depôt. Some writers, but we think wrongly, fix Walton's Fleet-street home two doors eastwards, at the south-western corner of Chancery-lane, the building whereof Mr. G. H. Birch, architect, designed a model for the "Old London" street at the Health Exhibition of 1884. Constructed mainly of wood and plaster, it had the bracketted front, with carved grotesques and projecting stories, of Edward VI.'s time, and it was pulled down in 1799. Eight years later, Walton removed to Chancery-lane, by Crown-court, west side, over against what was afterwards Jacob Tonson's first shop by sign of the "King's Head." A view of Drayton's house was taken in 1884, *e curis* Mr. Alfred Marks, for the Society for Photographing Relics of Old London. Thomas Campion, the poet and "Doctor of Physicke," was buried in the old church of St. Dunstan, on March 1, 1619-20, as witnesses the register, which also records

the interment in the parish graveyard, in Bream's-buildings, of 667 persons (out of a total of 847 for the year) who were killed by the Plague of 1625.

NO. 16, Wellington-street, Strand, marked by its bow front, is being converted for purposes of an enlargement of the Gaiety Theatre. It had been the business premises of the *Army and Navy Gazette* since January 7, 1860, having formerly been occupied by Messrs. Bradbury & Evans. During their tenancy the first-floor rooms were used, we understand, by Charles Dickens as editor of *Household Words* before the offices of that journal were removed to a house higher up the same street at the corner, south-west, of York-street. Of the four old houses in the Strand standing between Strand-lane and the Strand Theatre, Nos. 166A and 167 are to be taken, together with their site of 2,520 ft. superficial for rebuilding uses. The block evidently dates from the early seventeenth century, if not before: the upper four stories have suffered but little alteration since their erection, retaining nearly all the old wood-frame, panel, and plaster work, though some eighteenth-century decoration, by way of festoons, head-pieces, and the like, has been added. Until recent years No. 166A was a hosier's, by sign over its doorway, of the Golden Fleece. Next west is an entry leading to Golden-buildings, of which very little now stands. Another demolition should not be passed unnoticed. It is that of some of the ancient houses in Cloth Fair, West Smithfield, which abutted against the narrow passage—covered by their overhanging stories—along the northern side of St. Bartholomew-the-Great church.

THE schools under the auspices of the Merchant Company of Edinburgh continue to be in a flourishing condition, and additions have been made to them from time to time. The Young Ladies' College, in George-square, has this year received an important addition, which has been carried out at a cost of about 10,000*l.*, under the directions of Messrs. MacGibbon & Ross, the architects to the Company. The building as it stood occupied two sides of a quadrangle, and the additions consist of nine large class-rooms, erected on the east side of the quadrangle, and the covering in of the quadrangle with a glass roof, so as to form a hall, which is 70 ft. in length and 60 ft. in breadth. The entrance to the college is by an arched doorway in the centre of an ornamental stone screen in front of the hall, the salient feature of which is a mock pediment richly decorated with festoons, vases, cornucopia, &c. The sanitary arrangements have received especial attention, a steam-engine being used for the introduction of fresh air and heating the interior. The Gillespie School, which stands in a park to the west of Bruntsfield Links, was originally a refuge for aged men and women; but, under a provisional order of 1870, it was converted into a school, the former inmates and future foundationers being provided for by way of annuities. The building consisted of a centre and two projecting wings in the castellated style which prevailed in 1801, when it was designed. The school has an average attendance of 1,400 boys and girls, and the addition consists of a third story to the central portion, leaving the wings remaining as at first,—two stories in height. The new accommodation consists of four class-rooms, sewing-room, &c. The cost of these additions will be about 4,000*l.*

WE have received Dr. Parson's report to the Local Government Board on the sanitary condition of the Foleshill Rural Sanitary District, in reference to the prevalence of enteric fever there. He states that the outbreak occurred at a group of seven cottages standing in gardens a short distance outside the town. These cottages, it is stated, have no drains, house-slops being disposed of on the gardens or thrown into a ditch at the back. They have pail-closets, the contents of which are utilised on the gardens. The seven cottages are supplied with water from one pump, "the water from which at the time of my visit was somewhat turbid and had an offensive smell and unpleasant taste." The report adds the following particulars as to the general state of the neighbourhood:—

"Bedworth is closely built; the streets have at the sides not only continuous rows of houses, but also numerous courts, approached by narrow entries, and shut in by high buildings. Many of the houses, which were built at a time when the ribbon trade was flourishing, have lofty weaving-rooms at the top, and owing to the absence of building regulations both in the past and present, not only have houses been built without an adequate amount of open space about them for the due circulation of air, and for the proper placing of privies and ashpits in reference to houses and wells, but such scanty space as was originally provided has been allowed to be encroached on, even in recent years, by extension of the original buildings, still further shutting out the access of light and air. Some of the older cottages, originally unsubstantially built, are now so ruinous as to be quite unfit for habitation, apart from their defective sanitary surroundings. A number of cottages in Bedworth belong to a wealthy local charity and are let at low rents, but these are far from setting a good example as regards sanitary condition; some are damp through being partly underground, or through the roof being out of repair; many of them are very badly off for water; there is a pump, but it often runs dry early in the morning, owing to the demand upon it and the scanty yield of water, and then water has to be fetched from a spring a quarter of a mile distant. Some of the Charity cottages have no drains, slop water being thrown into the road gullies; and at one block three privies, connected with a huge wet open ashpit, have to serve for twenty houses, some of which are at a considerable distance from it. The nearest of these privies is only 18 in. from a dwelling-house, where the stench and swarms of flies are much complained of, and in this house five of the family have suffered from fever during the late winter. . . .

The privies in Bedworth are midden privies of the worst kind. The middensteads (or 'cisterns,' as they are locally called) are very large and deep, often uncovered and invariably wet and offensive. The number of privies is insufficient, two or three being often used jointly by a large number of households, and as usual under such circumstances some were found in an uncleanly condition. Owing to want of space they are not unfrequently placed much too near houses; one such instance has been already mentioned; in another yard a new house has been built against an old privy, the damp from which soaks through the wall into the parlour; another privy, with large middenstead serving for six houses, is built against a factory just under a window.

The removal of refuse is contracted for, and under order of the Local Government Board is charged as a special expense on the parish of Bedworth. The work, however, is ill done. No regular rotation is adopted; the cart is only sent when complaints are received by the Inspector of Nuisances. Many full and overflowing middensteads were noticed by me, and complaints were made of the offensive manner in which the work was carried out.

The water supply of Bedworth is derived solely from shallow wells, and is both scanty and impure."

IN the *Encyclopédie d'Architecture* is a short article signed "H. C." giving the facts as to the proposed Eiffel Tower for London, with some sarcastic comments. The game is begun now, says the writer: "After Paris, London; after London will probably come Vienna, Madrid, Brussels, New York, and in twenty years all the capitals in the world will have a metallic tower 300 mètres high." "H. C." is glad to hear that there is to be no "ornamental" treatment on the London tower, and thinks that in that sense it will be an advance on Paris. But he is concerned to hear that it is to have a smaller base. Were we not told that the base and lines of the Eiffel tower had been exactly calculated for the necessary conditions of stability? Has this been all wrong all the time?

"O calculateurs, qui calculeriez en kilogram-mètres la force développée par votre cervelle quand elle calcule, vous nous avez donc leurrés avec toutes vos savantes déductions sur les *moments des forces*? . . . . A moins que ce ne soient les Anglais qui se trompent, après tout. C'est ce que nous verrons. Mais en tout cas, j'avoue qu'il serait plus utile de s'appliquer à éviter la rupture des ponts et la rencontre des locomotives, que de dépenser un argent fou à la construction d'une tour de 300 ou 305 mètres qui ne sert à rien et qui sera probablement toujours fort laide."

Touching the proposed tower for London, we learn that the selected design has been carefully revised. A contract for putting in the concrete foundations has been let, and this portion of the work is well advanced. During the last few days some of our leading ironwork contractors have been asked to tender for the construction of the tower itself, and it will be interesting to see what price per ton this kind of work is likely to cost. There is no doubt that building a structure two-and-a-half times as high as St. Paul's is no slight undertaking. It will demand many novel contrivances to facilitate its erection, and some consideration must also be given to the feelings of the British workman, who will not care to be placed in such an exalted position without being adequately remunerated. We much regret to hear that Sir Benjamin Baker has consented to become engineer for the tower. Surely the engineer of such a work as the Forth Bridge would have better consulted his position and repute in declining to have anything to do with so foolish a business.

LETTER FROM PARIS.*

THERE is more talk than ever of suppressing the "Direction des Beaux-Arts," the titular head of which department, M. Larroumet, is about soon to resume his former functions as Professor of French Literature at the Sorbonne. The succession to his position is warmly contested, though the office, in fact, has a great many drawbacks, with few compensating advantages. The world of art is not a very easy one to manage, considering the delicate susceptibilities and self-appreciation of artists; the collisions between the administrator and the administrated are frequent and often disagreeable; and a Director of Fine Arts, whatever his merits, generally finds it convenient to retire after two or three years. MM. Chennevière, Guillaume, Paul Mantz, and Kaempfen succeeded each other rapidly, and M. Charles Blanc's rule of five years is spoken of as a remarkable instance of longevity in the office. Nevertheless, competitors for the honour are not wanting. Among others are named M. Pommeraye, professor at the Conservatoire; M. Roger Ballu, at present an Inspecteur des Beaux Arts, and son of the eminent architect of the Hôtel de Ville; and M. Henri Havard, the well-known art-critic. Perhaps the proposed change will be confined to including the functions of the Minister of Fine Arts under those of the Department of Public Instruction, a very wide-reaching department which already includes the duties of Inspection of Fine Arts, the Provincial Museums, the National Museums, the École des Beaux-Arts, the French Academy at Rome, the Conservatoire of Music, and the similar institutions in the provinces, the national theatres, the surveillance of the other theatres, the Monuments Historiques, and the national manufactures. This is a pretty extensive circle of administration, it will be admitted, and one which gives rise to very large expenditure; the budget for this department for 1892 being estimated at 8,140,955 francs.

In regard to the manufactory at Sèvres, so much discussed recently, the Minister of Public Instruction has announced that he is prepared to defend energetically the future of that institution, the services of which he highly appreciates. According to him, it is owing to the constant study and research made in the laboratories at Sèvres that the character of the porcelain manufacture of France is kept up; and the Minister (who is perhaps a little too optimist in the matter) will confine himself to sanctioning some reforms in the internal administration of the establishment, which it is universally admitted are very much needed. Since the death of M. Deck, moreover, there has been no recognised director, and the Government has been very long in choosing one. The probable successor in the office is M. Vogt, a distinguished chemist, at present chief of the "Atelier des 'Moufles,'" and one of the most competent men of the day in ceramic work. There is some talk also of M. Deloye, a sculptor (author of the Garibaldi monument at Nice), being entrusted with the

* Unavoidably postponed from last week.

direction of the art-work at the manufactory, as Carrier-Belleuse formerly was.

Whatever the choice of the Ministry may be, it is evident that the national art manufacture of the country is not at present in a progressive state. M. Bracquemond, the well-known etcher, who occasionally drops the *burin* to occupy himself with ceramics, has set forth, in an interesting pamphlet, his ideas as to the causes of this decadence, which may be summed up in this sentence:—"The manufactures are in a bad state because the instruction in drawing is bad." That is, unfortunately, a recognised truth, which he demonstrates in an unanswerable manner. In France, he says, the teaching of drawing is concentrated on the conception and execution of the picture and the statue by painters and sculptors, and for architects, on combinations of the art of ancient Greece. The result is that the young artists, imbued with purely academic tastes, neglect every-day objects, while the artisans remain strangers to the arts. As a practical conclusion, M. Bracquemond demands that in future drawing should be taught in reference to its special application to special objects, and that the national manufactures should be preserved only as schools of applied art. This would be a transformation so profound and so radical that it would be necessary to wind up all the existing institutions before commencing such a re-organisation. The Parisian press is unanimous in demanding a reorganisation of instruction in drawing, which might open a new industrial field for numbers of artists of both sexes who are now struggling painfully for a livelihood, whose lives terminate in poverty, if they escape madness or suicide. This is a grave problem, and one which calls for solution; and if the Government intends to take in hand the cause of the arts, and exercise an official tutelage over art-training, it ought to be on such a system as to give to the young an instruction which will enable them to turn to account, in industrial art, the talents now often entirely wasted for want of a field for their exercise.

In addition to the new art-museum at Auteuil, the municipality of Paris is organising a new museum to be installed permanently in the Palais des Arts Libéraux at the Champ de Mars. This museum will be a central deposit for all the documents relating to the various services of the capital ("Hygiene," "Eaux et Egouts," "Incendies," "Préfecture de Police et Secours Publics," "Assistance Publique," "Hospices," &c.). Architecture will be represented by the plans and models in relief of the new monuments of Paris, such as the Hôtel de Ville, the École de Medicine, the Musée Galliera, and the Sorbonne. This collection will be increased by degrees by all the designs premiated in future competitions. This, as will be seen, is a museum essentially modern and quite distinct in its object from the Carnavalet museum, which deals with the history of the past, and will continue to receive all documents relating to ancient Paris. Among recent contributions to it may be mentioned that given by the Baronne Salomon de Rothschild, who possesses the house formerly inhabited by Balzac. As this house must soon be removed, Mdme. de Rothschild has had it photographed under all its aspects, and this collection of views will be of much interest to future archæologists. We may mention also that the Trocadéro museum has been enriched by a splendid chimneypiece from Bruges, which has been for a long time in the Louvre.

M. Alphand, whose zeal in improvements is indefatigable, has commenced a new campaign for continuing the system of sewers, commenced by his former collaborateur, M. Belgrand. Besides these important works, which deal with the district on the left bank of the river, the municipal administration is also carrying on various works in road-construction which will be of great utility. It is prolonging the Rue Ste. Cécile, which now terminates in a *cul-de-sac* behind the Conservatoire de Musique, up to the Rue de Trévise. This operation will open a new and direct communication between the Faubourg Poissonnière and the Faubourg Montmartre, in the midst of an exceptionally busy quarter. A large company of navvies and gardeners are now also employed in transforming into a large square the hitherto neglected and uncultivated area of the "Arènes de Lutèce"; while around this neighbourhood fine new houses are beginning to replace the ancient tumbledown structures of the district. Lastly, at Bercy, M. Lheureux, the architect, is continuing the work of the construction and approaches of the warehouses, and at Auteuil M. Salard, architect, a former collaborateur of Ballu, is rebuilding the Jean-Baptiste-Say school, after a design of which the cost is estimated at 1,416,000 francs.

Unfortunately, in addition to these works of real utility, and which will give employment to a number of workmen for the next twelve months, there are others equally necessary which are much neglected, and which are concerned with the preservation of our public monuments. Although the Parisian "ediles" are very parsimonious in regard to any expenditure on churches, it is as well, nevertheless, to preserve those on which part of the beauty of Paris depends. Now the sculptural groups which adorn the façade of the Church de la Trinité have been left to go in an absolutely disgraceful state of decay. There are works there by Crank, by Cavelier, and by Carpeaux, which are frittering away more and more. Some of the statues are without arms and some even without heads. This neglect is not only inconsiderate, but dangerous, for the church fronts on a square generally full of people, and where children are constantly playing about; and the authorities ought at least to make it safe, in spite of their repugnance to spending any money on a church.

Various competitions have been decided at the École des Beaux-Arts during the month. In the first-class of architecture the programme was "Un Monument à la Concorde," and out of seventy-four designs sent in, the jury awarded second medals to MM. Doumie, Guilbert, and Pillette (pupils of M. Laloux), to M. Marcel de Monelos (pupil of MM. Daumet and Girault), and to M. Jaboulay (pupil of M. Blondel). In the sketch competition, of which the subject was "Un Monument Funeraire," out of sixty-six sketches the jury gave a second medal to M. Sirot, pupil of M. Moyaux. In the second-class competition in architecture, of which the subject was not a very good one, "Un restaurant dans un promenade publique," among forty-one designs M. Garnot, pupil of M. Moyeaux, obtained a first mention; and in the examination in stereotomy, medals were awarded to MM. Chanut, Auclair, Cazenave, Lefèvre, Mayeux, Seillier, Pappa, and Howard.

The École des Beaux-Arts has divided several of the prizes founded in favour of the students of the Academy at Rome. The Leprince prize, for instance, it has divided into three, going to M. Lavalley for painting, M. Sicard for sculpture, and M. Eustache for architecture. The Cambacérès prize has been divided also between M. Déchenaud (painting) and M. Lefebvre (sculpture). M. Eustache has obtained the Delaunay prize, and M. Normand the Pigny prize.

We may mention here a scheme for an exhibition to consist entirely of the works of winners of the Prix du Salon and of the Bourses de Voyage, since the origin of these prizes. Considering what brilliant and celebrated men have won these prizes since 1874, such an exhibition ought to be very interesting, but it seems extremely difficult to realise, as most of the works are in the departmental museums or in the Luxembourg, whence there will be difficulty in extracting them, and other executed works are in the public gardens, and it would be a great expense to remove them temporarily.

We have to record the death of M. Michel Willenich, painter to the Ministry of Marine. This artist was born at Alexandria and naturalised as a Frenchman. He was trained under Gustave Boulanger, Jules Lefebvre, and Kuwasseg. He had exhibited every year at the Salon since 1870, and was an artist of great talent and a very hard worker, greatly esteemed also for his amiability and high character.

THE ENGLISH IRON TRADE.—There is, on the whole, a slight improvement noticeable in the English iron market, especially in the Cleveland district. No. 3 Cleveland pig is now quoted 40s. 6d., a rise of 1s. on the week. Bessemer pig in the north-west is 2s. higher, but this advance is entirely due to speculative influence, the demand remaining very dull. Scotch pig is still quiet; but more activity is observable in the Glasgow warrant market. Manufactured iron is in moderate request, and Staffordshire black sheets are 2s. 6d. higher. Steel is in fair inquiry generally; but there is somewhat more doing in shipbuilding material. Blooms are 5s. lower in the north-west of England. Shipbuilders and engineers continue fairly well employed; but there is a slackening off in the coal trade.—*Iron.*

ARCHÆOLOGISTS IN IRELAND:

THE CAMBRIAN ARCHÆOLOGICAL ASSOCIATION AT KILLARNEY, TRALEE, AND DINGLE.

ON the evening of Monday, the 10th ult., the town of Killarney presented a scene of unusual bustle and excitement, consequent on the arrival of the large body of members of the Cambrian Archæological Association, who had accepted the hospitable invitation of the Royal Society of Antiquaries of Ireland to hold a joint meeting there. The capacity of the hotels was taxed to the uttermost in order to accommodate so many extra guests at the height of the tourist season, but the arrangements previously made by the secretaries were so excellent that every one was provided for as well as could possibly be desired. The members had quarters allotted to them in several different hotels, each possessing its peculiar advantages. Those who were at the Railway Hotel congratulated themselves on not having to drive two or three miles on an outside-car before reaching their destination, whilst those at the Victoria Hotel thought the magnificent views of the lakes and mountains were sufficient compensation for being located some distance out of the town.

The proceedings opened on Tuesday, the 11th, with a meeting at two o'clock p.m. in the Town Hall for the reading of papers. Amongst the objects exhibited was a crozier, and photographs of a shrine,—exceptionally fine specimens of ancient Celtic art in metalwork. The crozier is now in the possession of the Most Rev. Dr. Coffee, R.C. Bishop of the Diocese of Ardfert and Aghadoe. It is of bronze, with interlacing beasts and other ornaments chased upon it, and inlaid with thin sheets of gold. It was accidentally found by a fisherman on the shores of the Killarney Lakes, not far from the ancient church of Aghadoe, to which, no doubt, it originally belonged. The shrine is shaped like the little stone-roofed oratories which were erected in Ireland between the seventh and tenth centuries, being of the same type as the reliquary at Monymusk, in Aberdeenshire, but not quite of so good a design. The decoration is of the usual Celtic character, with interlacing patterns. This interesting relic is the property of Mr. Thomas Plunkett, M.R.I.A., by whom it has been deposited for exhibition in the Museum of the Royal Irish Academy, in Dublin.

After the meeting was over, the party, numbering nearly 200, made an excursion by carriage through Lord Kenmare's demesne to Ross Castle (a mile and a half south-west of Killarney), thence by boat to the Island of Innisfallen on the Lower Lake (one mile north-west of Ross Castle), afterwards returning by the same route, and proceeding to Muckross Abbey (three miles south of Killarney).

Ross Castle, now an exceedingly picturesque ivy-clad ruin, beautifully situated on the shore of the lake, was built by one of the O'Donoghue Ross chieftains. It dates from the fourteenth century, but has been a good deal altered and added to subsequently. Ross Castle was the last fortress in Ireland to hold out against the Parliamentary forces. It possesses no architectural features of special interest.

The Island of Innisfallen presents attractions to the historian, as being the place where the celebrated "Annals of Innisfallen" were compiled in the thirteenth century; to the lover of the beauties of nature, on account of its exquisite surroundings; and to the antiquary, because he has here just such specimens of ancient art as afford him the keenest pleasure to examine. Deeply embosomed in trees near the landing-place are the ruins of an abbey founded in the seventh century by St. Finian, and a short distance to the north stands a remarkably good example of a small Hiberno-Romanesque oratory, with a highly-ornamented round-headed doorway. The latter building consists of a single rectangular chamber 16 ft. long by 10 ft. wide, and is lighted by a round-headed window in the gable wall opposite to the doorway.

The ruins of Muckross Abbey stand within the demesne of Mr. Herbert, on the east side of Lough Leane, and a mile north of the modern house of Muckross. The foundation of the Abbey (popularly so-called, but more correctly speaking the Priory) is ascribed to the M'Carthys, in 1340, by the "Annals of the Four Masters," and it became the chief burial place of his family, and of the O'Sullivans, MacGillacuddies, and O'Donoghues. The chancel is in imitation of the style of the end

of the thirteenth century, the nave and transept in that of the fourteenth, and the central tower in that of the fifteenth. An inscription on a stone built into the north wall of the choir inside shows that the church was restored in 1626. It reads as follows:—

> "Orate pro felicitate fratris
> Thadei Nolani qui hunc sacrum
> Conventum de novo renovare
> Curavit anno domini millessimi
> Sexcengentissimo vicessimo sexto."

The building is of the same type as most of the other Franciscan abbeys of Ireland, of which examples were subsequently seen during the meeting at Quin, Askeaton, and Adare, all possessing the same peculiarities in the details of the cloisters, the central towers, and the tracery of the windows. The cloisters are arranged round a square quadrangle, but instead of having a penthouse roof covering the ambulatory (as in the English cathedrals), there is an upper story containing the conventual offices. A very foreign look is given to the cloisters by the rows of small pointed arches springing from double columns. The walls of the upper story rise perpendicularly above the arcading on all four sides of the quadrangle, shutting out the light to a great extent, and forming a sort of deep square well. The smallness of the apertures between the columns of the arcading increases the gloom to such an extent that even when the mid-day sun is at its brightest the cloisters are shrouded in semi-darkness. At Muckross some beautiful effects of colour are produced by the green tinge given to such rays of light as are able to pierce through the branches of a gigantic yew tree that almost entirely fills up the quadrangle.

The central towers of the Irish Franciscan abbeys did not form part of the original design of the building, but were inserted at a later period. There being no piers provided for the support of a tower in the original design, massive cross walls were built for the purpose within the area of the church, leaving only a narrow opening of great height in the centre, instead of a wide chancel arch. The architectural effect of the exterior is thus improved, but only at the expense of ruining the interior. The towers are generally rectangular, and not square. Their proportions are bad and the details poor. The castellated parapet, made in several steps, and the flat projecting stones that take the place of gargoyles, or ornamental spouts for throwing off the water from the roof, are features peculiar to Ireland. The tracery of the windows consists of vertical mullions curving off into intersecting arcs of circles at the top. The entire absence of cusping makes the whole look bald and unfinished. The dressings are of hard limestone, which preserves a remarkably sharp edge for centuries, so that any lack of beauty in the details becomes very apparent.

Illustrated descriptions of Muckross Abbey, and other buildings visited during the excursions, will be found in the *Gentleman's Magazine* for 1864 and 1865. It would be worth while re-printing these admirable "Notes on Irish Architecture."

In the evening, the Irish and Welsh archæologists dined together at the Railway Hotel, and listened afterwards to an eloquent address by the Rev. Prof. Stokes, D.D., on "The Island Monasteries of Wales and Ireland."

On Wednesday, the 12th, an excursion was made by carriage to Aghadoe (three miles west of Killarney); thence, past Killalee Church, to Dunloe Castle (three miles further to the west); afterwards going through the gap of Dunloe (a distance of eight miles south from Dunloe Castle); and returning by boat through the three Lakes of Killarney.

Aghadoe is well worth visiting, both for the magnificent view to be obtained from thence of the surrounding panorama of lakes and mountains, and also in order to see the group of ancient buildings that occupy so fine a position. The ancient ecclesiastical remains consist of a church and the stump of a round tower standing on the north-west side, besides which are the mouldering walls of an old castle situated on the grassy slope of the hill-side below. The church is composed of two separate rectangular chambers adjoining each other, the one on the west being in the Hiberno-Romanesque style of the twelfth century and the other exhibiting Pointed details. The chief feature of the western half of the church is the beautifully-enriched, round-headed doorway in the gable wall. The astern portion of the building has a double lancet window in the end wall, deeply splayed on the inside. These double lights are peculiar to Ireland, the lancets in the English churches of the same period being usually arranged in groups of three, with the centre one taller than those on each side, and splayed only on the jambs inside, but not all round the top, too, as in Ireland. There is an incomplete Ogam inscription on a stone built into the south wall of the east portion of the church. (For illustrations of the buildings at Aghadoe see Lord Dunraven's "Notes on Irish Architecture," vol. 2.)

The chief object of interest near Dunloe Castle is an underground chamber, the roof stones of which are covered with Ogam inscriptions. It was discovered in 1838 by a labourer who was digging in the sandy soil of the high ground to the west of Dunloe Castle, near the junction of the rivers Laune and Loe. These souterraines (or "eirde houses," as they are called in Scotland) are usually found within the fortified areas of the Irish raths, and were probably the cellars beneath structures above ground, in which objects of various kinds were stored. The sides of the Dunloe cave are built of dry rubble masonry, and the roof is composed of long flat slabs laid across the top horizontally. The Ogam inscribed stones were, no doubt, taken by the builders of the cave from a neighbouring "killeen," or ancient burial-ground, being chosen on account of their suitability for the purpose of forming the roof of the underground structure. A full description of the Dunloe cave is given in R. Rolt Brash's "Ogam Monuments of the Gaedhil."

At Dunloe Castle the party were hospitably entertained to luncheon by Dr. and Mrs. Stoker. The remainder of the excursion through the Gap of Dunloe and the Lakes of Killarney was exceedingly delightful, but was made more for the sake of giving the members an opportunity of seeing some of the most beautiful scenery in in Ireland rather than with any particular archæological object in view.

An evening meeting was held in the Townhall, at Killarney, for the purpose of hearing Prof. J. Rhys's Presidential address on the "Early Irish Conquests of Wales and Dumnonia," and Mr. Romilly Allen's paper on "Celtic Art in Wales and Ireland compared."

It must be borne in mind by the reader that the chief object which the Royal Society of Antiquaries of Ireland had in view when they invited their Welsh brethren to cross the St. George's Channel was not to show them the most lovely scenery in the British Islands, but to afford a long-wished-for opportunity of comparing the early Christian remains of the two countries. In order to accomplish the main purpose for which the meeting was held it was necessary to leave Killarney behind, with many regrets, and make for the western promontory of the County Kerry, occupied by the Barony of Corkaguiny, a district probably richer than any other throughout the whole of Ireland in the earliest forms of ecclesiastical structures and inscribed monuments.

A special train, starting at 7.30 a.m. on Aug. 13, took the whole party from Killarney to Tralee (twenty miles northward), the distance being accomplished in three-quarters of an hour. The remaining portion of the journey was on the new light railway from Tralee to Dingle (thirty-eight miles south-westward) taking about three hours. The railway is constructed to a 3-ft. gauge, and follows the course of the high road almost the whole way, rising at the summit level to 800 ft. above the sea. The line takes a westerly direction from Tralee along the north shore of the promontory, as far as Camp, where it turns to the south-westward, crossing the range of hills diagonally to Anascaul, and then continues its westerly course along the southern shore of the promontory to Dingle, the whole distance being 38 miles. For some inscrutable reason, the existence of this line is ignored by Bradshaw.

The train was brought to a standstill at a point eight miles west of Tralee, just before the line commences to ascend the pass through the mountains, to enable the members to inspect the ruins of Killelton Church, which lies a few hundred yards up the hillside to the south of the railway. It is a small, rectangular, dry-built structure of the most primitive kind, measuring 16 ft. long by 10 ft. 6 in. wide internally, the walls being 3 ft. 6 in. thick. The only openings are a square-headed door with sloping jambs in the west wall, and opposite to it a window (probably round-headed when perfect), with sloping splayed jambs, in the eastern wall. This church has recently been described in the *Journal* of the Royal Irish Society of Antiquaries. Time did not allow of anything but the most cursory examination of Killelton Church, and getting once more into the train the journey was continued up the tedious ascent. Unfortunately, a dense sea fog came on, obscuring everything, to the great disappointment of most of the party. The last break in the journey was at Ballintaggart, two miles south-east of Dingle, where the societies were met by the reception committee. A short walk across a couple of fields brought the members to an ancient burial place, surrounded by a circular stone wall, occupying a commanding position on rising ground overlooking Dingle Harbour. This cemetery belongs to a class of which there are numerous examples in the south-west of Ireland. They are called "keels" or "killeens," and are used now only for the burial of unbaptised infants and suicides. Some difference of opinion exists amongst experts as to whether these cemeteries were, in the first instance, Pagan or Christian. In the case of the one at Ballintaggart, the meaning of the name, *i.e.*, "Priest's town," would seem to indicate that it was of Christian origin. The fence round the Ballintaggart Killeen is not more than a hundred years old. The circular enclosure within measures 90 ft. in diameter. The surface is covered with innumerable tiny graves, having small stones at the head and foot, marking the places where unbaptised infants have been interred from time to time. Strewn about at intervals on the uneven, lumpy surface of the ground, are nine rounded water-worn boulders of old red sandstone brought from the sea-beach, averaging 3 ft. 6 in. long by 1 ft. 3 in. wide by 10 in. thick, inscribed round the edge with Ogams, and in three cases marked with an incised cross of early form on the broad face. The inscriptions are of the kind usually found on such monuments, recording the name of the deceased and his descent, in the ancient Celtic language. The following will serve as a sample for the rest:—"Dofeti Maqqi Cattini"—(The Tomb) of Dofet, son of Cattin. On one of the other stones, the name Maqi Decceda occurs. It has also been found on four Ogam stones in Ireland, and on two stones inscribed with debased Latin capitals, one at Penrhos Llugwy, in Anglesey, and the other at Buckland Monachorum, in Devonshire, showing how widely distributed the clan bearing this name must have been.

After luncheon at Benner's Hotel, Dingle, an excursion was made by carriages to Kilmalkedar, five miles north-westward. The town of Dingle does not leave a favourable impression on the mind of the visitor, its streets being particularly filthy and the houses having a wretched tumble-down appearance, without the atoning merit of being picturesque. The most imposing public building is the police barracks, a red brick monstrosity, hideous enough to have been designed by Lord Grimthorpe himself when in playful mood. The only redeeming point about Dingle is that excellent lobsters are to be bought there at a very low price. The first mile out of the town, to the west, is along the side of the harbour, now concealed by a deep pall of sea fog, and its existence only to be guessed at from the pleasant odour of sea-weed. The next two miles is along a dreary stretch of perfectly straight road going in a north-westerly direction across the boggy plain at the foot of the mountains. Beyond this the ridge of hills is crossed at a height of about 700 ft. above the sea, and the mist rolling away discloses the sandy beach of Smerwick Harbour lying below in the distance. The landscape is very like that of Pembrokeshire or Cardiganshire, quite devoid of trees amongst the hedgerows or elsewhere, so that the divisions between the fields assume an undue prominence, looking like the reticulations on a surveyor's map, and were it not for the beautiful variations of colour and exquisite forms of the contours of the hills, the effect would be hardly less monotonous. The small group of houses constituting the village of Kilmalkedar is situated on a hill-side overlooking Smerwick Harbour, and behind it, five miles to the north-east, Brandon Mountain rises to a height of over 3,000 ft. Almost at the top of Brandon Mountain is still to be seen the ruined oratory of St. Brendan, the navigator, about whose voyages almost as many marvellous stories are told in Mediæval literature as about Sinbad the Sailor in the "Arabian Nights."

That saints were more numerous in Corkaguiny in old days than at present is attested by the following legend still firmly

believed in the locality. Once upon a time there was a procession of saints from Kilmalkedar Church to St. Brendan's oratory, and the leader of the procession discovered to his great annoyance, on arriving at his destination, that he had left his service-book behind him; so the word was passed down the line to have it brought, and when it reached the last man it was found he was only just leaving Kilmalkedar. He, therefore, went into the church, fetched out the missing book, and it was then passed from hand to hand right up to the top of Brandon Mountain. Now, whatever grain of truth there may be in this story, the fact remains that in and around Kilmalkedar there are a sufficiently large number of specimens of the handiwork of the early Celtic Christians to give colour to the belief that saints were as plentiful as blackberries, or,—if treated after the fashion of the statistical fiend,—to reach from Kilmalkedar to Brandon Hill.

The principal early remains consist of (1) the Hiberno-Romanesque church of Kilmalkedar; (2) a small dry-built stone-roofed oratory or house (said to be that of St. Brendan) not far from the church on the north side; (3) a larger dry-built stone-roofed oratory in ruins a quarter of a mile to the west of the church; (4) a similar building in a perfect state, called the Oratory of Gallarus, one mile south-west of the church; (5) several ruined beehive huts to the west of the church; and (6) a circular stone fort enclosing the remains of three or four beehive cells one mile south of the church, close to the road on the west side.

Besides these there are other later structures, namely (1), the conventual buildings close to the church on the north side; (2) the "Chancellor's House," a quarter of a mile south of the church; and (3) the Castle of Gallarus, one mile south-west of the church, between the Oratory of Gallarus and the shore of Smerwick Harbour. Space does not allow of a description of these buildings in detail, and for further information we must refer the reader to Lord Dunraven's and Mr. Petrie's works on Irish architecture.

Mr. Arthur Hill, who formed one of the party on this excursion, has published an excellent monograph, giving a complete series of measured drawings of Kilmalkedar Church. It is one of the most interesting buildings of its kind in Ireland, and presents several remarkable features peculiar to Irish work, such as the stone roof (now fallen), the prolongation of the side walls so as to form a pilaster-like projection beyond the gable wall, and a curious winged finial on the top of the gable. The arcading of the walls of the interior of the nave, the chancel arch, and the west doorway are fine specimens of the highly ornate Hiberno-Romanesque style. In the churchyard are several interesting monuments:—(1) a large plain cross; (2) an early sun-dial, ornamented with Celtic patterns; (2) an Ogam inscribed pillar; (3) a small fragment of an early inscribed cross-slab; and (4) an abecedarium stone with an almost complete ancient Irish minuscule alphabet of the ninth or tenth century carved upon it, the first letter only being broken away.

The early buildings at Kilmalkedar are most instructive, as enabling us to trace the gradual development of the Christian stone-roofed church from the Pagan beehive cell. The stages of this development seem to be as follows:—(1) We have the beehive cell, circular in plan inside and outside, with dry built walls converging towards the top, the courses being laid horizontally, each one overlapping the one below it; (2) a similar structure, but rectangular in plan inside and circular outside, as in the case of the cells on Skellig Michael; (3) a similar structure, rectangular in plan inside and outside, the walls having a straight sloping batter at the bottom to form the side walls, and a convex curved batter at the top, to form the roof, as in the case of the oratories at Kilmalkedar, Gallarus, and Temple Gael; (4) a mortar-built stone-roofed church, having vertical walls and sloping roof, the whole being laid in horizontal courses, as in the case of Kilmalkedar Church. In looking at a cross section of the latter, the weak point in the construction will at once be apparent. When the side walls were given separate existence, independent from the roof, by making them vertical, instead of sloping inwards the whole way from the ground up to the ridge, the span of the roof was thereby increased and the masonry of the side walls was unduly weakened at the point where side walls end and the roof begins. In consequence of this defect the roofs of all the churches constructed on this principle have fallen in. As soon as the use of the arch became familiar to the Irish builders an obvious remedy suggested itself, namely, to support the roof on a barrel vault, leaving a small chamber between the top of the vault and the underside of the roof. Thus an entirely new and original type of structure was evolved, consisting of two chambers one above the other. In the later and more perfect examples, like Cormac's Chapel on the Rock of Cashel, the upper chamber was considerably enlarged and roofed with a pointed barrel vault, but the horizontal courses were still preserved on the outside, as the last remnant of what was derived from the Pagan style of building.

On the return journey to Dingle some of the party visited Temple Geal, or Temple Managhan as it is also called. It is situated one mile to the south-west of the road from Kilmalkedar to Dingle, about halfway between the two places. The remains here consist of a dry-built stone-roofed oratory, of the Gallarus type, in ruins; an Ogam-inscribed pillar, with a plain Latin cross incised on two faces; and four stones marked with incised crosses of very early form within circles. It is the custom at this and other places, on particular days in the year,—either the anniversary of the saint to whom the church is dedicated, or Christmas Day, or Easter Sunday,—to "pay rounds," *i.e.*, to walk in procession from the saint's well several times round the church sun-wise. A complete investigation of these ancient customs might be the means of throwing much light on the founders of the various churches. In the neighbourhood of Dingle, St. Manchan, St. Molaga, St. Kieran, St. Gobnet, St. Finan, and St. Flannan receive special reverence.

On returning to Dingle, those members who had arranged to join the expedition to Skellig Michael on the following day slept at Dingle, whilst the rest went on to Tralee.

A DAY AT SKELLIG MICHAEL.

A trip to Skellig Michael is only possible under the most favourable circumstances, partly on account of the difficulty of obtaining suitable means of transport to so inaccessible a spot, and also because the landing on the rock cannot be attempted except when the sea is quite calm. By the courtesy of the Rear-Admiral Commanding, H.M. gunboat *Banterer* was placed at the disposal of the archæological societies, besides which the Commissioners of Northern Lights were kind enough to allow their s.s. *Alert* to assist in carrying the excursionists to the Skellig. Much uncertainty existed, even up to the last moment, as to whether the day would prove fine enough to make the attempt, for when many an anxious face peered out from the windows of Benner's Hotel, at Dingle, on the morning of Friday, August 14, the sea-fog was still to be seen hanging round the tops of the neighbouring hills, making the prospect sufficiently gloomy to depress the spirits of all but the most enthusiastic antiquaries. However, every one was up in time for an early breakfast, but at eight o'clock a.m., the time fixed on the programme for starting, the vessels that were to convey the party had not put in an appearance. Just as we were beginning to give up all hope the joyful tidings were brought that H.M.S. *Banterer* had arrived in the harbour, and its boats were ready to take the party on board. The *Banterer* had left Bantry the day before, and the delay was caused by the fog, which necessitated putting into Ventry Harbour for the night, instead of going straight on to Dingle. The members, sixty in number, soon assembled on the beach and were rapidly rowed across the harbour to the ship, which was lying close to the entrance, nearly a mile off. Here a terrible disappointment awaited the ladies, for Commander Roper declined to undertake the responsibility of risking their valuable lives by taking them on the voyage, and so they were sent ashore without more ado. The gunboat was, moreover, not as well adapted for the accommodation of ladies as H.M.S. *Pinafore*, nor was its commander apparently as partial to the society of the fair sex as Mr. W. S. Gilbert's Captain Corcoran.

At 9 a.m. the *Banterer* steamed out of the narrow entrance of Dingle Harbour, and soon encountered the heavy swell in the bay outside. As the sea fog began to lift, the outlines of the perpendicular cliffs on the west side of the harbour could be distinguished, although the tops of the mountains were still enshrouded in mist. The rocks are of the old red sandstone formation, the colour of which varies so much according to the locality. Here the tint is a delicate pink. By the time the gunboat had got half way across Dingle Bay, a decided improvement in the weather took place, and the magnificent scenery of the west coast of Kerry could be seen to advantage.

To the north was the long line of cliffs of the promontory of Corkaguiny stretching out far to the westward, broken only by the wide gap forming the entrance to Ventry Harbour, and terminating in Slea Head, beyond which again was the Great Blasket Island, sometimes called "the next parish to America." To the south there were the dark masses of rock near Doulus Head, Valentia Island, with its meteorological station perched on the edge of the cliff, and a glorious background of mountains extending away inland as far as the Magillicuddy's Reeks above Killarney.

The sun now shone forth brilliantly, and the Skellig for the first time became visible, although on a fine day it can be seen from Dingle, from which place it is 28 miles distant in a straight line to the south-west.

The first impression from afar off is of an isolated rock rising out of the sea in a single cone like a miniature Peak of Teneriffe; but on nearer approach the Skellig is seen to consist of two pyramidal masses of rock joined together at the base. The sides of the pyramids in reality make an angle of about 45 degs. with the horizon, but owing to a well-known tendency of the mind to over-estimate the steepness of upward slopes, the cliffs appear to be almost perpendicular. One peak is higher than the other, and much more pointed. The lower peak is slightly rounded on one side, and has a projecting shoulder about half-way down. Those who had seen the illustration of Skellig Michael in Lord Dunraven's "Notes on Irish Architecture" were inclined to think that the artist had exaggerated the height and rugged features of the rock; but this is not the case, as the reality is far more impressive than any picture could possibly make it. The dedication to St. Michael, the patron saint of high places, at once calls to mind the somewhat similar isolated rocks in Normandy and Cornwall bearing the same name. These, however, sink into utter insignificance beside the wild grandeur of the Skellig. By one o'clock the *Banterer* had arrived at its destination, after a passage of four hours, and the excursionists were soon safely landed in the ship's boats. As not a moment was to be lost of the precious time allowed for the exploration of the rock, the party at once commenced the arduous ascent to the summit, resting only for a few minutes to take in the beauty of the situation. The Great Skellig, or Skellig Michael, lies to the south-west of Valentia Island, opposite to St. Finan's Bay, and is $8\frac{1}{4}$ miles from Bolus Head, the nearest point on the mainland of Kerry.

The Little Skellig, an islet of brilliant purple colour, with a jagged outline, the favourite haunt of the gannet, is situated a mile and a quarter to the north-east, and between it and Puffin Island is the Lemon Rock. The Great Skellig is about half a mile long, from north-east to south-west, and a quarter of a mile from north-west to south-west, across the widest part. The southern peak rises to a height of 714 ft., and the northern one to a height of 611 ft. above the sea. The landing-place is close to the mouth of a cave at the north extremity of the island, just round the east side. There are two lighthouses on the island, the lower one at the south point, and the upper one on the west side of the higher of the two peaks. A zigzag road cut in the face of the cliff, and protected on the seaward side by a strong parapet wall, leads from the landing-place at the north end of the island, the whole way along the east side to the lower lighthouse at the south point, and is continued round the west side to the upper lighthouse.

This road was constructed at great expense by the Trinity Board, and the landing-place at the same time considerably improved by widening the ledge of rock and cutting steps. Even now boats find it almost impossible to approach when there is any swell on from the Atlantic, as the waves rise and fall as much as 20 ft. at a time.

The ancient Celtic monastic settlement on Skellig Michael is situated at the north end of the rock, just below the summit of the lower of the two peaks, and almost immediately above the landing-place. The old approach to it was straight up the nearly perpendicular

face of the cliff on the north-east side. The lower part of this route was cut away when the new road to the lighthouses was made, but a flight of 620 steps still remains from a point about 120 ft. above the sea up to the monastery. The path can be seen following a winding course over the inequalities of the cliff above the landing-place. In places the ground has been levelled up, with retaining walls of dry-built rubble-work to support the steps. The ascent must have been almost as perilous as that to the Convent of Meteora, in the Levant.

The present approach to the monastery is partly new and partly old. From the landing-place the party followed the new road along the east side of the rock, in a southerly direction nearly as far as the lower lighthouse, but before reaching it they left the road, and, turning westwards, commenced to climb the grassy slope leading up to "Christ's Saddle," the name given to the saddle-shaped part of the island between the two peaks. The flight of steps up to "Christ's Saddle" is old, except near the bottom. From this valley between two hills the steps branch off in opposite directions, one path going north-east, towards the monastery, and the other south-west, to the summit of the highest peak. The ascent of the stairs to the monastery is steep enough, but the climb to the highest peak is positively dangerous. The latter was successfully reached by some of the more adventurous, but the majority of the party contented themselves with the less perilous adventure.

Having arrived at the top of the stairs, the monastery was entered by a passage through the wall by which it is surrounded at the south end of the enclosure.

The strata of the rock composing the lower peak of the island dips at an angle of about 45 degrees downwards towards the east, leaving a precipitous cliff facing the west, with a broad, slightly convex ledge at the top. Below this ledge, to the east, is the plateau on which the monastic settlement stands. The plateau has been artificially levelled up in a series of steps by building retaining walls on the sloping face of the cliff. The area enclosed within the surrounding wall measures about 300 ft. long by 100 ft. wide, and the buildings within occupy a space of 150 ft. by 50 ft. The remains consist of six beehive cells, two oratories, two wells, five ancient burial grounds, several rude crosses, all belonging to the early period, and the later Church of St. Michael. The settlement is protected at the back by the rounded ridge of rock, sloping up towards the top of the cliff on the west. There is a step down from the lower end of the ledge behind to the level of the plateau on which the buildings stand, and this is faced with a dry-built retaining wall, running north and south.

Parallel to the retaining wall, at a short distance from it, is a row of five beehive cells close together having an eastern aspect, and in a line with them at the extreme north end of the enclosure a small oratory overhanging the cliff. The remainder of the buildings, namely, the Church of St. Michael, the second oratory, and the sixth beehive cell, are situated at a rather lower level, in a row, also nearly parallel to the retaining wall at the back. A ground-plan is given in Lord Dunraven's "Notes on Irish Architecture" (Vol. I., p. 30), showing the position of the various buildings, but the different levels are not clearly indicated, and, in fact, they could hardly be explained intelligibly except by means of a model. The ground next the retaining wall at the back is the highest, and is on a level with the springing of the domes of the beehive cells. A flight of eight steps leads from this level to that of the ground in front of the doorway of the cell at the north end of the first row, and a flight of fourteen steps leads to the level of the ground in front of the four other cells in this row. The oratory with the burial-places round it, and the remaining cell are at the lowest level of all.

The whole of the structures are built of dry rubble masonry, except the church of St. Michael. The cells are rectangular in plan inside, and round or oval outside; except in one case, where the outside is rectangular at the bottom. The roofs are domed, and formed with horizontal overlapping courses, as in the pagan "clochauns." The only openings are the door, which has inclined jambs and a flat head, and a small rectangular hole to allow the smoke to escape. The oratories are constructed like the cells, but they have a window opposite the door, and are rectangular in plan both inside and out. Over the doorway of one of the cells and also of one of the oratories is a cross formed in white quartz pebbles, which contrasts with the dark coloured slate of which the rest of the wall is built. The door of the largest cell has a double lintel, like the entrance to Staigue Fort, co. Kerry. The masonry of the surrounding wall is also very similar in character to that of Staigue Fort. The position of the oratory at the north end of the enclosure is most perilous, being perched on a spit of rock so as literally to overhang the sea, which breaks into white foam hundreds of feet below.

Skellig Michael "has been the scene of annual pilgrimages for many centuries, and the service of the Way of the Cross is still celebrated here, though with some perfectly traditional forms of prayer and customs, such as are now only found to exist among the islanders along the west coast of Ireland" (see Lord Dunraven's "Notes on Irish Architecture"). Mr. Lecky refers to the pilgrimages made here and to Lough Derg, and Dr. Smith, in his "History of Kerry" (1754), gives a remarkable description of the custom existing in his day:—"When the pilgrims have visited the cells and chapels they ascend the top of the rock, part of which is performed by squeezing through a hollow part resembling the funnel or shaft of a chimney, which they term the Needle's Eye. This ascent, although there are holes and steps cut into the rock to climb by, is far from being gained without trouble; but when this obstacle is surmounted the pilgrim is at a small flat place, about a yard broad, which slopes away down both sides of the rock to the ocean. On the further side of this flat, which from its narrowness on the top is a kind of isthmus, the ascent is gained by climbing up a smooth, sloping rock that only leans out a very little, and this they call the Stone of Pain from the difficulty of its ascent. There are a few shallow holes cut into it where they fix their hands and feet, and by which they scramble up. This kind of a sloping wall is about 12 ft. high, and the danger of mounting it seems terrible, for if a person should slip he might tumble on either side of the isthmus down a precipice headlong many fathoms into the sea. When this difficult passage is surmounted the remaining part of the way up to the highest summit of the rock is much less difficult. On the top are two stations to visit, where there are also some stone crosses. The first is called the Eagle's Nest, probably from its extreme height, for here a person seems to have got into the upper regions of the air, and it is ascended by the help of some steps cut into the rock with much difficulty. If the reader can conceive a person poised, as it were, or, rather, perched on the summit of this pinnacle, beholding the vast expanse of the ocean all around him, except towards the east, where the lofty mountains on the shore appear like so many low houses overlooked from the lofty dome of some cathedral, he may be able to form some idea of the tremendousness and awfulness of such a prospect. The second station which the devotees have to visit on this height, and which is attended with the utmost horror and peril, is by some called the Spindle, and by others the Spit, which is a long, narrow fragment of the rock, projecting from the summit of this frightful place, over a raging sea, and this is walked to by a narrow path of only 2 ft. in width and several steps in length. Here the devotees, women as well as men, get astride of the rock, and so edge forward until they arrive at a stone cross, which some bold adventurer cut formerly on its extreme end; and here, having repeated a Pater Noster, returning from this concludes the penance."

It has been generally supposed that the ancient Celtic monks chose the most inaccessible spots (such as the Skellig) for the sites of their monasteries, in order to avoid contact with the outer world as much as possible. We throw out the suggestion that during a period when travelling by land was attended with considerable danger, owing to the unsettled state of the country, the sea offered a safer means of transit, and these island monasteries may have served the purpose not only of "deserts in the ocean," but may also have formed a chain of stations round the coast for assisting the monks and their friends in making their voyages, for warning ships against being wrecked, for rescuing drowning persons, and, in fact, taking the place of the modern Trinity Board and Lifeboat Service in rendering navigation less perilous.

There are very few historical notices connected with the Skellig, but a lurid light is thrown on the terrible sufferings that the Danish invasions must have caused to the monks by the following brief entry in the Annals of Ulster, under the year A.D. 823:—"Eitgall, of Scelig, was carried away by the strangers, and soon died of hunger and thirst."

At 5 o'clock the party embarked on board the *Alert*, which had arrived to take the place of the *Banterer*, and were safely brought back to Dingle by 9 p.m.

We cannot conclude this account without protesting most strongly against the way in which repairs are being carried on at Skellig Michael by the Board of Works. At the time of the visit of the Cambrian and Irish archæologists an ordinary mason was seen calmly tinkering away at the ruins, pulling down a bit here and building up a bit there in imitation of the old style of work, without any kind of superintendence whatever. The vandalism perpetrated some time ago by the same authorities at Innis Murray is being repeated here with a vengeance.

SEVENTH INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY.

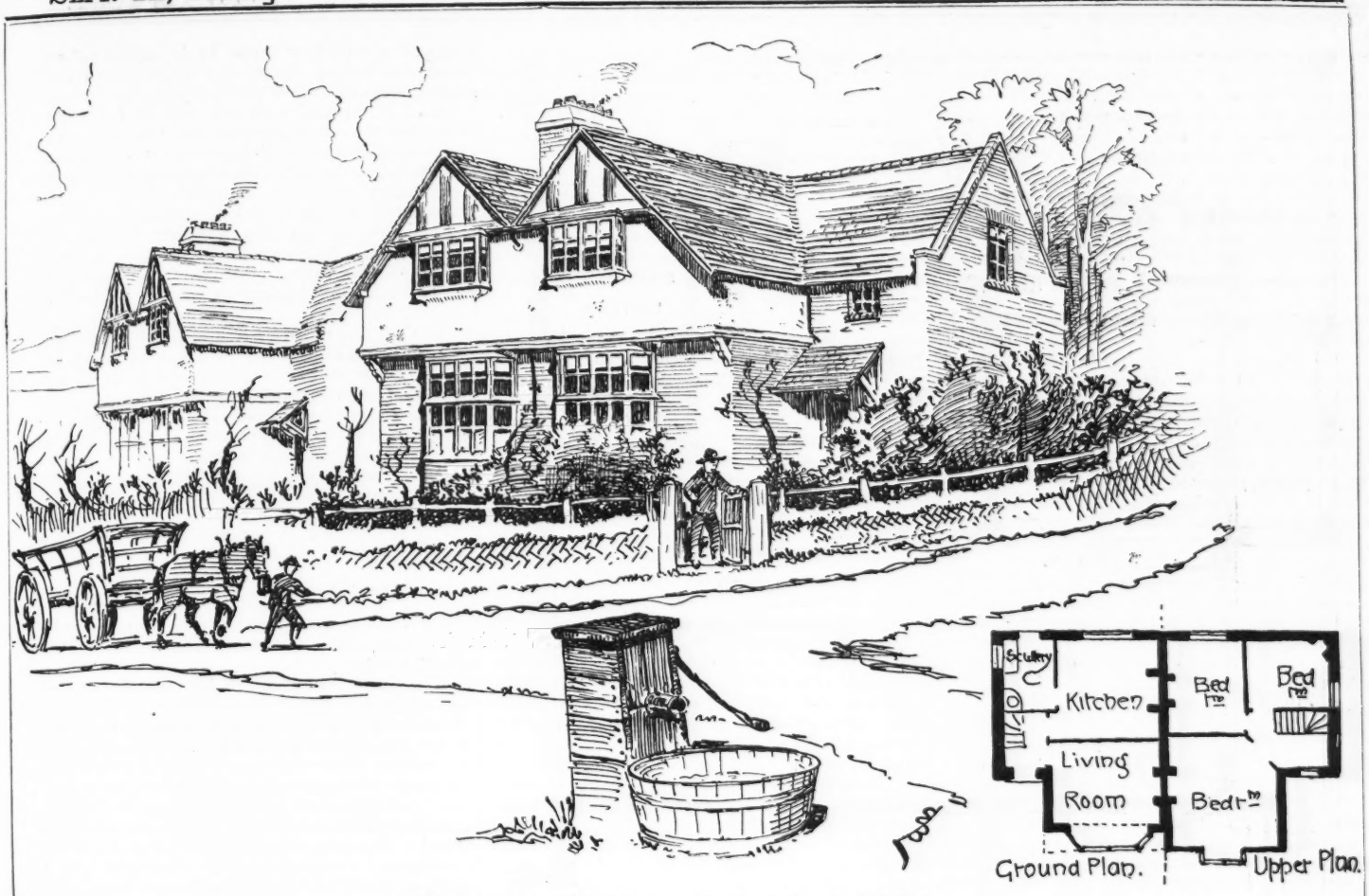
AT the final general meeting of the Congress, held in the theatre of the London University, Sir Douglas Galton presided. Commenting on the proceedings of the week, the President pointed out to what a great extent the success of the Congress had been helped by the support given to it by the Prince of Wales, first in presiding at the inaugural proceedings, and afterwards by personally presenting the delegates of foreign Governments to the Queen. The Congress of London had exceeded in importance all that had preceded it, nearly 3,000 members having taken part in the proceedings. This country was behind Continental countries in the more theoretical part of the science of hygiene, because of the prejudice here against operating on living tissue, but in many practical ways, both in matters of construction and of administration, we had things to show of the highest interest and value. The efforts to disseminate sanitary knowledge, to promote efficiency of workmanship, particularly among plumbers, the supply of water, and the administration generally in large cities, particularly Glasgow and Manchester, would be fruitful in instruction to the foreign members. Some of the resolutions were calculated to produce important improvements in our sanitary practice, particularly one in favour of improving the status of the public sanitary inspectors.

The secretaries, Dr. Poore and Dr. Corfield, brought forward the resolutions passed in the sections and by the Council, one of them being in favour of accepting the invitation of Hungary, on the proposal of M. Körösi, to hold the next Congress at Buda-Pesth, in 1894. A resolution with the same object was now submitted to the general body and carried.

After M. Körösi had returned thanks, Dr. Poore added what M. Körösi through modesty had failed to add, that he would give the sum of 1,500 francs as a prize for the best work on the subject of "Demography" and its progress in the chief countries of Europe and America.

Special resolutions of thanks were accorded to the Secretary of State for India, to the Viceroy and a number of native potentates, who had most munificently supported the Congress; to Denmark for its splendid gift in the form of the work on demography; to the Queen, and finally to the Prince of Wales for his co-operation. Thanks were also passed to the leading officials of the Congress and to the principal foreign delegates. Many speeches were made, of which the leading types were made by Dr. Brouardel, President of the Permanent Committee of the Congress, Dr. Eugen Sell (Germany), and Dr. Kilasato, which were as follows:—

Dr. Brouardel, speaking in the name of the Permanent Committee, expressed the most lively thanks to the committee of organisation and to its president, Sir Douglas Galton. The attendance at the proceedings of the Congress of more than 3,000 persons, and the hearty help given by their English colleagues was a proof of the earnestness which they brought to the consideration of questions of hygiene. What most struck all foreigners,—and what, too, must permanently remain in their memories,—was the fact that in every rank of life the laws of hygiene were more thoroughly respected than in any of the foreign countries from which they came. Among the many happy remembrances of a memorable visit made to



Four Cottages at Maidstone.—Mr. E. B. Lamb, Architect.

a great people, they would always retain the profound impression created on their minds by the spectacle of a whole nation making sacrifices of money, and even of personal liberty, where they found it necessary or good for the health of each other. Such an example of solidarity they had nowhere seen, and, in the hope of achieving similar results, they were, in returning home, resolved to follow that example. In London they had found the most admirable hosts, and they would none of them forget the pleasant hours they had been permitted to pass in the midst of the families of their English entertainers. Every foreign delegate had been deeply touched with the kindness and graciousness of her Majesty Queen Victoria and H.R.H. the Prince of Wales. In three years he hoped they would all meet again in another country, and he trusted they would then be able to prove to Sir Douglas Galton and his colleagues that their efforts to interest and instruct their foreign guests had not been unfruitful.

Dr. Eugen Sell, responding for Germany, expressed the liveliest gratitude for all the marks of gracious condescension lavished on the foreign delegates by her Majesty the Queen of England, and by H.R.H. the Prince of Wales. What a magnificent spectacle of activity, unity, and goodwill had been presented by the gentlemen who had undertaken the difficult task of organising and preparing the work of the Congress! With what promptitude and unbounded hospitality they had opened their arms, their doors, their clubs and lodges, and the *entrée* to their unparalleled societies, to their foreign visitors! In the name of the German Government he expressed his warmest thanks for the magnificent hospitality which had been tendered to Germany's representatives in common with those of other countries.

Dr. Kilasato (Tokio, Japan), speaking in German, replied on behalf of his country. His country was, unfortunately, too far off for it to think of inviting the Congress to give Japan an opportunity of returning the hospitality its representatives had enjoyed here. He could only thank the Committee in words, and assure it that Japan would endeavour to profit to the utmost by the knowledge they had derived from the brilliant lectures of so many eminent and distinguished authorities. His countrymen felt it the highest privilege to have the affectionate guidance of Western culture, and on their behalf he would wish the Congress and its leaders, as was the custom in his country, "happiness for ten thousand years"—"*Manyai Manyai.*"

Among the various visits paid by members of the Congress we may mention that a deputation from the Engineering Section, consisting of some seventy members, visited Ealing, and were entertained to lunch by Mr. E. M. Nelson, J.P., the Chairman of the Local Board. The object of the deputation was to visit the various municipal and other works carried out in this suburb. The chief points of interest and inspection were the new public buildings (covering some two acres of ground), viz., the Public Offices, Free Library, Victoria Memorial Hall (opened by the Prince of Wales in 1888), Public Baths, Stables, Workmen's Shops, Mortuary, deodorising apparatus for treating the sewers, and not forgetting the Fire Brigade establishment. The whole erected at the cost of some 40,000*l.* The peculiar feature of this expense is that no increase has been made in the rate for the last eleven years, showing the highly progressive character of the neighbourhood, and the fact that the works were for the necessities of the public are fully appreciated by the public themselves. From the public buildings the visitors proceeded in carriages to the sanitary depôt. These well-known precipitating works have been remodelled during the last twelve months, and the old works of 1863 and 1864 have been well-nigh swept away. The precipitating tanks were not in operation, not being quite completed.

The chief point of interest was, no doubt, the refuse destructor and fume-cremator, the latter the invention of Mr. C. Jones, the Engineer and Surveyor to the Board (who had in the course of the morning read a paper on "House Refuse and Refuse Destructors"). The operations carried out in connexion with the destructor called forth the favourable opinion of the visitors, Ealing being probably the only place in England where the same class of work is carried out. Not only is the house refuse destroyed, but the sewage sludge (which has proved such a difficult question in many towns) is destroyed with it. Mr. Jones informed the company that during the twelve months ending June not one load of sewage sludge had been removed from the premises. The difficulties in connexion with the gases and fine dust, &c., are overcome by means of the cremator. The fact that the whole of the machinery at the works is worked by steam raised in connexion with the destructor and cremator, also elicited approval. Arrangements are being made to light the works by electric light, the motive power being obtained from the same source.

The deputation were also much interested in the new road water-cart, the invention and patent of Mr. Jones. The principle of this cart is that the water is thrown forward towards the heels of the horse instead of backward, the laying of the dust is accomplished underneath the cart and two small jets are affixed at the back of the cart, the water projected therefrom only on the road already made damp by the stream which is turned inward, and consequently these jets only settle more firmly the dust which the water sprouting from the preceding part of the apparatus has previously moistened and laid, all disadvantages of dust raised by ordinary water vans being obviated.

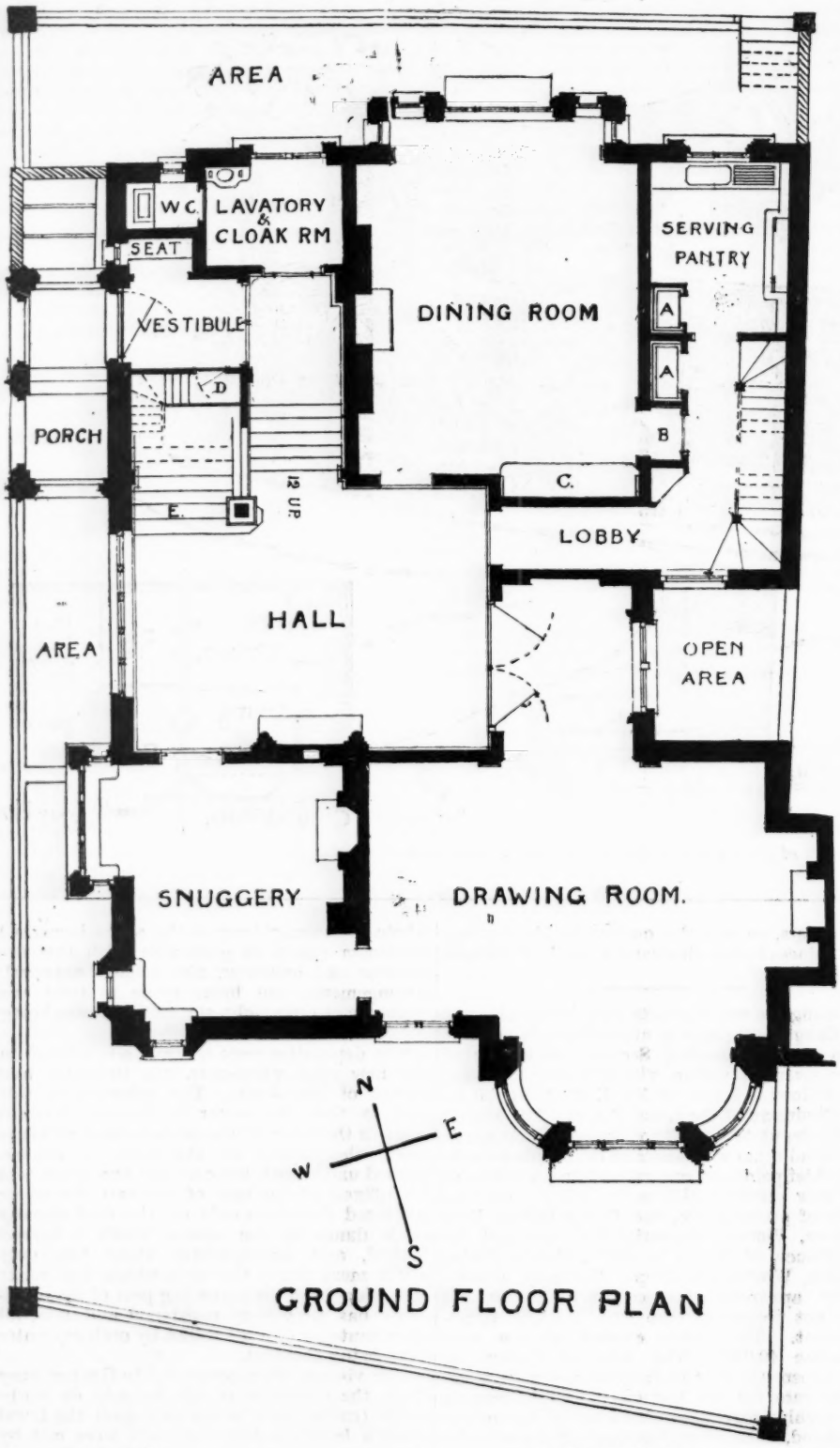
The visitors then proceeded to Gunnersbury Park, the residence of Mr. Leopold de Rothschild (calling on the way to inspect the Local Board's Isolation Hospital), and were met by his agent. Afternoon tea was kindly provided for the visitors, and an enjoyable hour was spent roaming about the delightful grounds and inspecting the mansion.

We have received from the Society of Medical Officers of Health the volume of "Reports of the Meetings and Discussions" of the Congress, being the six special daily numbers of *Public Health*, edited by Dr. A. Wynter Blyth (London: E. W. Allen). It is a useful though not complete record of the proceedings of the Congress, and contains other mistakes than those contained in the list of errata. For instance, on p. 180, col. 2, line 18, "the late Mr. Girder" should be "the late Mr. *Gordon*," Engineer to the London County Council.

FOUR COTTAGES AT MAIDSTONE.

THESE cottages are to be built of red bricks and rough-cast. The roofs are to be covered with Broseley tiles. The ground-floor consists of parlour, kitchen, and scullery, with water-closet in yard at back. There are three bedrooms above. The cost will be about 600*l.* Mr. E. B. Lamb, of London, is the architect.

e



A.—Lifts.
B.—Serving Door.
C.—Sideboard.
D.—Servants' Stairs.
E.—Principal Staircase.
F.—Tradesmen's Entrance.

House, Palace Court.

Illustrations.

SCULPTURE: "À LA TERRE."

THE sculptured figure with this title, of which we give an illustration this week, gained for the sculptor, M. Boucher, the "Médaille d'Honneur" of the Salon of this year; the medal awarded to what is adjudged to be on the whole the most remarkable work of the year. Few of those who visited this year's Salon, we imagine, will be disposed to dispute the verdict.

The figure, which may be called colossal in scale, being far above life-size, stood at the upper end of the Sculpture court of the Palais d'Industrie at the Salon exhibition. It may be taken to represent the type of man as a laborious tiller of the earth in the sweat of his brow. The firm manner in which the feet are planted on the ground, and the powerful leverage which the man is about to exert on the heavily-laden spade, are very well conveyed by the sculptor; and in addition to this power of modelling and expression of action, there is a pathos about the work, as a representation of Toil, which gives a moral grandeur to it, and raises it to the level of a work of ideal art.

NEW PREMISES, CHESTER.

THE premises shown in one of our illustrations have been erected for the Duke of Westminster, and occupy a site at the Cross, Chester, having a frontage of 60 ft. to Bridge-street, and 67 ft. to Watergate-street, the new site having been obtained by taking down old and dilapidated premises of an uninteresting architectural character, and by rearranging the new premises the old site was considerably contracted by the giving up of 18 ft. of the old frontage in Bridge-street, in order to widen Watergate-street, the Duke having given up about 837 square feet of land for the improvement of the street, which was formerly inconveniently narrow at this point. The new buildings consist of four shops in Bridge-street and three in Watergate-street and Row, with their warehouses and show-rooms over.

As it is imperative in the city of Chester to continue the old footway in the "Rows," it will be seen that this well-known feature has been preserved in the new buildings, one entrance to the "Rows" being at the angle in the position it formerly occupied, and the other at the end, where they adjoin the existing line of old premises, at which point advantage has been taken of the broken line to form a covered porch with steps leading to the old "Row" in Watergate-street.

The half-timber work will be executed in oak; the piers and arches up to the first string are of Yorkshire stone, the work over being of red Ruabon bricks and stone dressings.

The whole of the floors are of fireproof construction, by Messrs. Dennett & Ingle, of Whitehall, and the contract is being carried out by Messrs. Parker Brothers, of Chester, under the superintendence of the architect, Mr. Thos. M. Lockwood, F.R.I.B.A., Chester.

Our illustration is taken from an Academy drawing.

NEW HOUSE, PALACE COURT.

THIS house occupies the corner site on the east side of the entrance to Palace Court from the Bayswater-road.

Externally the structure is built of dark-red facing bricks, all the architectural features, cornices, jamb-mouldings, &c., being executed in cut and rubbed gauged brick. The principal rooms and main staircase on ground and first floors are finished and panelled in wainscot oak, and have ornamental plaster ceilings by Messrs. Battiscomb & Harris, of Great Marylebone-street. The general contractors for the work are Messrs. Foster & Dicksee, of Rugby, and I think it due to them to state that they have carried out the work most excellently.

W. FLOCKHART.

We may add that the drawing from which our illustration is produced was in the Royal Academy exhibition this year.

SOUTH KENSINGTON MUSEUM COMPETITION:

CENTRAL HALL OF MESSRS. DEANE & SON'S DESIGN.

ONE of our illustrations this week is a view in the Central Hall of the design submitted by Messrs. Deane & Son, but we regret that up to the time of going to press we have no description of it to hand.

COMPETITIONS.

THE GLASGOW ART GALLERY SCHEME.—According to the *Scotsman*, the Executive of the Glasgow Association for the Promotion of Art and Music have issued the conditions of the preliminary competition of architects for the proposed buildings in Kelvingrove Park, Glasgow. Architects are invited to submit sketch designs for buildings intended to provide accommodation for a central hall, art galleries, museum halls and galleries, a school of art, refreshment-rooms, &c. There will be two divisions of the competition—a preliminary one of sketch designs open to all; and a final one limited to those who may be invited to take part in it. It is directed that the central or music hall should be the principal feature, its floor space being not more than 12,000 square feet; that the suite of art galleries should provide not less than 2,000 lineal feet of wall surface, in saloons measuring not more than 35 feet in width; that the museum halls and galleries should possess, if possible, 40,000 square feet of floorage, disposed to allow the spacious display of sculpture, antiquities, general art collections, technological and engineering exhibits; and that the school of art should, if possible, possess a floorage area of 12,000 square feet. The sum at disposal is 120,000*l*, and the committee do not wish to exceed that sum. Mr. Alfred Waterhouse, R.A., has been appointed to act with the committee as assessor, and with his advice the committee will select six from the designs in the preliminary competition, whose authors will be invited to take part in the final competition. Each of the architects so invited will receive one hundred guineas, except in the case of the successful competitor, whose premium shall merge in his commission of 5 per cent. for carrying out the work. All designs must be sent in by December 1 next, addressed to Mr.

Waterhouse at the City Chambers, Glasgow. The day for sending in designs in the final competition will probably be March 31, 1892.

SOUTHAMPTON FREE LIBRARY.—The first premium in this competition has been awarded to Mr. A. E. J. Guy, of Southsea, and the second premium to Mr. S. R. J. Smith, of London. We notice the designs in our first article this week.

THE TRADES UNION CONGRESS.

THE annual Trades Union Congress was opened on Monday at Newcastle-on-Tyne, when Mr. Thomas Burt, M.P., was elected President.

The Parliamentary Committee's report, presented by Mr. Charles Fenwick, M.P., Secretary to the Committee, contained the following passages:—

The Law of Conspiracy.

"During the past year several important judgments have been given in the law courts against trade unionists, under the Law of Conspiracy.

The Conspiracy Act of 1875, as passed by the House of Commons, defined intimidation for which trade unionists were to be punishable, 'to mean and include only such intimidation as would justify a justice of the peace, on complaint being made to him, in binding over the person so intimidating to keep the peace.' These words, which were struck out when the Bill was considered in the House of Lords, would have rendered such decisions almost impossible.

With regard to the judgment of Mr. Bompas, the Recorder of Plymouth, it is difficult to conceive a more foolish or absurd rendering of the law relating to strikes than that stated by him in the notorious case of Carran *v.* Treleaven. 'A strike,' says Mr. Bompas, 'for the purpose of raising wages or altering the conditions of employment is lawful, unless accompanied by violence or intimidation, but a strike for the purpose of compelling employers not to employ other persons or to alter the terms of employment of such other persons is illegal.' Such an interpretation of the law would render it impossible at times for workmen to dispose of their labour with freedom, and upon conditions satisfactory to themselves, as the influence of 'such other persons' as those to whom Mr. Bompas refers, is often the sole or principal reason why Unionists are unable to raise their wages or alter the conditions of their employment.

Happily there has been obtained from a superior court—though not without considerable expense—a more rational and just interpretation of the law, and one which, it is hoped, will check any further tendency to strain it for the purpose of injuring trade unionists.

Through the kindness of Mr. Edmund Robertson, who, last session, brought forward a Bill to amend the law relating to conspiracy and intimidation, we have been favoured with the following memorandum on the law as left by recent decisions in the law courts:—

The Conspiracy Law Amendment Bill of last Session proposed to enact (1) that no combination shall be punishable (with certain specified exceptions), unless the object be criminal in itself, and (2) that intimidation, under section 7 of the Conspiracy and Protection of Property Act, 1875, shall be limited to such intimidation as would justify a magistrate in binding over the person so intimidating to keep the peace—or, in other words, to 'such intimidation as implies a threat of personal violence.'

Recent decisions have not removed the necessity for legislation on these lines. First: As to intimidation, the Queen's Bench Division, in the recent cases of Gibson *v.* Lawson, and Curran *v.* Treleaven, held that the facts therein proved did not amount to intimidation within the meaning of the Act of 1875.

In Curran *v.* Treleaven it is decided in terms, that 'to tell an employer that if he employs workmen of a certain sort the workmen of another sort in his employ will be told to leave him, and to tell the men when the employer will not give way, to leave their work, is certainly not intimidation.'

In Gibson *v.* Lawson it was decided that to tell a workman that if he does not join a certain society, his fellow-workmen who are members of that society will strike, is not intimidation. (In this case the resolution to strike was communicated to the employer, who thereupon dismissed the workman, in order to avoid a strike.) But the Court does not attempt to define intimidation, further than to say that it 'must receive a reasonable and sensible construction according to the circumstances of the cases as they arise from time to time.'

The Court does not decide,—it expressly refrains from deciding,—that intimidation 'must be limited to threats of personal violence,' although it admits that 'there is much to be said for that view.' 'It may,' says Lord Coleridge, 'become necessary to decide this point in time to come: it is not now.' This judgment upsets the construction placed on the Act by Mr. Bompas; but it does not settle the law as it would have been settled had the Conspiracy Bill of this year passed, or as it was actually enacted by the repealed Act of 1870. 2nd: As to conspiracy, it has been urged that workmen are sufficiently protected by the Act of 1875, which exempts from the operation of the common law combinations 'in furtherance of a trade dispute between employers and employed.' That these words are not sufficient to protect workmen is shown by a trial in the Glasgow Sheriff Court, on March 30 last, when two men were convicted on a common law charge of conspiracy to deprive a man of the means of earning his livelihood, by making threats to his employers that if he was retained in their service they would withdraw from their employment all members of the trade union.

The Sheriff directed the jury that there was no evidence that the illegal acts were done in furtherance of a trade dispute between employers and workmen, and, therefore, the exemption in the third section of the Act of 1875 did not apply.

The facts here are almost identical in character with the facts in the case of Gibson *v.* Lawson. But in that case the accused was charged with intimidation, and acquitted; while in the Glasgow case the men were charged with conspiracy and convicted. Acts which are innocent when the charge is intimidation, become criminal when the charge is conspiracy. In other words, acts which are innocent when done by one person become criminal when done by two or more persons in combination.

The purpose of this memorandum may be summed up thus: The Act of 1875 enacts, as to a certain class of trade disputes, that a combination shall not be deemed criminal unless its object is in itself a crime—some exceptional cases being expressly excepted.

This principle ought, subject to these exceptions, to be made a general rule of law. Its limitation to certain trade disputes has the appearance of conferring special privileges upon workmen, while in reality the Act is insufficient for their protection. It is in the interest of workmen, as workmen and as citizens, that instead of the common law doctrine, and the limitation thereof introduced by the Act of 1875, there should be substituted the simple rule, applicable to all men, in all except a few exceptional cases, that combination shall be criminal only when its purpose is to perpetrate crime.

Your committee consider that the thanks of this Congress are due to Mr. Robertson, and likewise to those who supported him in his efforts to amend the law in the direction indicated by this memorandum, and would suggest that he be requested to bring forward the Bill again next Session.

In this connexion we strongly urge upon the trades the necessity of placing sufficient funds at the disposal of the Parliamentary Committee, to enable them to engage the best legal advice in the interpretation of points of law, drafting bills, &c., as may, from time to time, arise out of and consequent upon the instructions of Congress."

Employers' Liability.

"Since 1888 the Government have made no serious effort to amend the Employers' Liability Act, notwithstanding their promise in each successive session to do so. The possibility of a private member being able to carry such a measure successfully through all its stages in Parliament is very remote, and unless the Government undertake the duty, we fear the law on this subject must remain for some time in its present unsatisfactory state; but it would be better, in our opinion, to retain the law as it is than to accept the arrangement proposed by the Home Secretary in the Bill of 1888.

Your committee, as instructed by last Congress, have prepared a Bill, which was introduced by Mr. Thomas Burt at our request, the provisions of which we hope you will be able to approve. Mr. Burt obtained an unfavourable position in the list, and consequently the Bill could not be considered.

The following particulars, taken from a Government return, will show the results obtained under the Employers' Liability Act, from January 1 to December 31, 1890:—

No. of actions brought	388	
No. of actions in which damages were obtained	109	
Total amount of damages obtained	£8,678	14 6
Average amount of damages obtained	£79	12 5
Cases pending	54	
Cases settled out of court	21	
Cases withdrawn	59	"

On Tuesday the Congress resumed its sittings.

The London Carpenters and Joiners.

The President said there had been a resolution handed up for which urgency was claimed, and he thought they could pass it without the slightest discussion. It was an expression of sympathy with the carpenters and joiners of London in their present struggle.

Mr. Knight, of the Boilersmiths' Union, moved the resolution, which was as follows:—

"That in the opinion of this Congress the carpenters and joiners of London in their struggles to obtain an eight hours day are deserving of our sympathy and support both financially and morally, and should be sustained in their gallant efforts to secure a victory by every means at the command of the bodies represented on this Congress."

Mr. H. R. Bailey, Co-operative Wholesale Society, seconded the motion, which was carried.*

The President's Address.

Mr. Burt, in his address, defended trades unionism and strikes in these words:—

"We are told, too, that trade unionism always means strikes. Some of the stupidest, some of the most foolish strikes I have ever known have been by non-unionists and of only partially organised men, and you may take this as a fact, that if the union once gets its feet fairly set on any proportion to its power, there will be a diminution rather than an increase of strikes. The newer unions have perhaps by their previous apathy, or by the difficulties they have had to face, found themselves hemmed in all round. They hardly have the right of existence. Their labours are victimised; they have nothing but strikes. But as they become organised, you will find that strikes will diminish rather than increase. Now, ladies and gentlemen, do not let me be misunderstood. Many of you know that I have faced difficulties in order to avoid strikes, but I am not here to utter a wholesale condemnation of strikes. On the contrary, I am here to say that, in many cases, owing to the clattering brawl of the machinery, owing to the defence of Mammon and its blindness, I am here to say that, in many cases, the workman cannot get attention until he stops the wheels. But it is an ugly weapon. I don't know whether any of you have tried to throw a boomerang. It is a very deadly weapon; but if it is not skilfully thrown, it is apt to come back, and to hit and to wound the thrower. So is it, gentlemen, with a strike. We cannot give up the right to strike, however. We are glad that through the watchfulness of the London Trades Council, we have had our right to strike vindicated before the law, showing that eternal vigilance is the price of liberty. But wherever we can have our difficulties and our disputes calmly argued and settled by the arbitrament of reason, I venture to say that we are fools—almost criminal—if we resort to a strike. One of the things, however, that trades unions have not vindicated is the right to ask and to demand of the capitalist, however powerful and proud he may be, that he shall receive and listen to your properly accredited representatives. Now the probability is that strikes in the future, when they do occur, will be on a larger scale than they have been in the past. Workmen will refuse to blackleg; they will refuse to do it either directly or indirectly. They will refuse to supplant, so far as they possibly can, their fellows who they believe are striking and struggling for their right. And, gentlemen, I have not a word to say against

* In connexion with this matter, it would seem, from an advertisement which appears in our columns, addressed to "architects, builders, and others," that one result of the strike is likely to be that work will be driven out of the country. In the words of the advertisement: "In consequence of the great difficulty of obtaining English-made joinery and the prohibitive cost it has now attained, a syndicate has been formed for the purpose of establishing manufactories on the Continent for both soft and hard wood in the English style."

that, and some of you may think it would be a wholesome lesson to the stupidest among the capitalists to teach them the value of labour by bringing, as far as possible, the industries of the country from day to day to a standstill. It is very attractive, and ladies and gentlemen, I venture to say that, if we were dealing with the stupidest and the most tyrannical, I, for one, would not discourage that idea. But bear in mind that it is a very difficult game to play, and that it would hurt the innocent much more than the guilty—that the heavy capitalist would hardly enjoy a single luxury the less. If you could carry on your strike long enough, and make it extensive enough to make him feel not only in his purse—perhaps the most vulnerable point—or next to his stomach the most vulnerable, you could make him feel in his stomach also; but long before you reach that, thousands and tens of thousands of women and children and the bread winners would have suffered, and perhaps, many of them have been carried to a premature grave."

We will mention some of the other proceedings of the Congress in our next.

MUNICIPAL ENGINEERING.*

WHEN I submitted the titles of one or two subjects to the Committee of Selection of this section, and their choice fell upon that of "Municipal Engineering," I felt some difficulty in dealing with a subject of such magnitude in the short time which is allowed for the reading of papers. It will consequently be necessary for me to exclude all detail, and to condense what I have to say in as short a compass as generalities will allow.

In the spring of this year the *Times* and other newspapers contained some controversial correspondence upon the "Growth of Local Indebtedness," and when we consider that this growth has been mainly due to sanitary and other works carried out by municipal authorities throughout the country, it will be seen that the office of "municipal engineer" to a local authority is of some importance where the disposal of such large sums mainly passes through his hands.

Sanitary engineering as a profession is of quite recent date. Fifty years ago very little attention was paid to sanitary matters, and the importance of pure water, fresh air, and the quick removal of organic waste were but little appreciated. Early in this century it does not appear that any towns possessed an officer whose duties were to deal with such subjects, and although a few of the larger cities became alive to the necessity of some action, and about the year 1840 some appointments were made similar to that of the "Town Surveyor," it was not till the year 1847 that this officer was first legalised under the Towns Improvement Clauses Act (10 & 11 Vict., c. 34, s. 7†). This was confirmed in the following year by the Public Health Act, 1848 (11 & 12 Vict., c. 63, s. 37), and is now law under the Public Health Act, 1875 (38 & 39 Vict., c. 55, s. 189).

In the early days of the "Surveyor," as he is legally called, his work was, as a rule, very different from what it is now. In a paper by Sir Henry Acland, read before the Association of Municipal Engineers and Surveyors in 1876, upon "The Relation of Modern Engineering to Public Health and Local Government," we find the following:—

"In the Public Health Act of 1875, the summary of all health enactments, the name of engineer does not once occur in the 343 clauses. He is still the old 'surveyor' we all remember, the plodding, energetic man of highways and byways, whose Anglo-Saxon vigour broke forth from the garb of corduroy, from the measuring tape and links into the transcendent skill of Macadam. . . . . But then the surveyor of the present day may be called to advise on anything, from the form and cost of an earthen syphon trap to the calculation for work to be done by engines which are to supply half a million of persons with water . . . . to be responsible for the construction of sanitary mechanisms, from a housemaid's sink to an intermittent downward filtration farm. . . . . He is to be able to carry out all measures for prevention of infectious diseases advised by the medical authority; he is faithfully to observe and execute all lawful orders of the Local Government Board which may be hereafter issued."

These words, by so eminent an authority as Sir Henry Acland, summarise the development of the town surveyor into the municipal engineer, and the duties of that officer which he has touched upon, open up the next part of my paper, that of the real work of the municipal engineer.

As I have already said, it would be impossible in a paper of this description to detail all the work which this responsible officer has to execute, and I have, therefore, prepared the accompanying diagram (see opposite page), which will, I think, graphically describe some of the ramifications coming under the head of municipal engineering.

Having then described the ramifications of the diagram, and briefly alluded to the engineering and other topics thus set forth, the lecturer continued:—I feel sure you will agree with me that municipal engineering requires a large and varied experience, unremitting labour and attention, and a constant acquisition of knowledge. Of the public advantages derived from this officer's work I will not dilate, well-paved and lighted streets, well-sewered and drained towns, pure water delivered to all parts of our dwelling-houses, the sanitary improvement of those dwelling-houses, public recreation grounds and parks, the amelioration of the condition of the people, and many other things, all speak of the work of this officer. Time will not permit me to more than allude to his present position. I fear it will be many years before the unostentatious character of his work will be fully appreciated; local government is nearly always decried, the necessity for taxation in order to carry out unproductive works will for a long time be unpopular, but I believe that the day will come when nations will cease to glorify in politics, war, and pomp, and when those who are engaged in the daily task of battling against disease and death will take that position in the world which I believe is already accorded to them by those who are advanced in thought and science.

* A paper by Mr. H. Percy Boulnois, M. Inst. C.E., City Engineer of Liverpool, and Past President of the Association of Municipal and County Engineers, read before Section VII., "Engineering in Relation to Hygiene," of the recent International Congress of Hygiene and Demography.

† The section is as follows:—"The Commissioners shall appoint, subject to the prescribed approval, or where no approval is required subject to approval by one of her Majesty's principal Secretaries of State, a person duly qualified to act as local surveyor of the paving, drainage, and other works authorised under the provisions of this and the special Act . . . . and the Commissioners with the like approval may remove any such surveyor.'

MAGAZINES AND REVIEWS.

THE *Art Journal* for September is varied and interesting in its contents. For frontispiece it gives an original etching of Holyrood, by Mr. Edward Slocombe. It also contains illustrated articles on "Pradilla, Painter-Laureate of Spain;" "Sculpture at the Royal Academy;" "The Museums of Industrial Art in Italy;" and "Old Art in the City Churches." Two other articles, also illustrated, deal with the antiquities and natural beauties of districts so far apart as Gatton and Godstone (Surrey), Otford and Chevening (Kent), and Skye, Gairloch, and Iona, in the Western Highlands of Scotland.

The Magazine of Art contains an illustrated article on "The Two Salons," by Mr. Walter Armstrong, and various other articles, one of which, entitled "A Waif of Renaissance Sculpture," by Stephen Thompson, gives illustrations of the effigy and tomb of Barbara Ordelaffi, at Forli. An article by Mr. James Orrock, R.I., on "David Cox and Peter de Wint," with illustrations of the work of each, should also be mentioned.

The *Contemporary Review* contains an article entitled "The Nationalisation of Cathedrals," by Mr. H. W. Massingham. It consists mostly of polemical matter, with which we do not concern ourselves, and will have more interest for the clergy than for our readers. Mr. Massingham's name is well-known as that of a prominent votary of what is called the "New Journalism," and his proposals are characteristic. The article is only of interest to us in so far as the maintenance of the cathedral fabrics themselves is touched upon by the writer, incidentally, in two or three passages. He says that "in some five cases,—Chester, St. Paul's, Norwich, Carlisle, and Durham,—there is a special fabric fund set apart for the maintenance of the cathedral in tenantable repair. But only at Chester, where the amount is 2,400*l.* a year, are these funds in any way adequate to meet the cost of repairs." Mr. Massingham contends that "collapse" has "befallen the administration of the great endowments which constitute the prize-fund of the Church." The question remains as to what remedy is to be found for it. "The Liberation Society," as the writer says, "has its cure ready-made," but,—it will be comforting to many to read,—he "does not foresee the time when the nation will be ready to hand over the cathedrals of England, the chief adornment of its ancient towns, so matchless in form, so unique in historic and spiritual interest, to a body of contending sectaries, inconspicuous for their learning." But what is Mr. Massingham's proposal on this head? Here are his words:—"It is clear that the deans and chapters ought to be at once divested of any control over their landed estates. All the cathedrals might then be handed over to the Ecclesiastical Commissioners. The repair of the fabric, being essentially a local work, would be placed in the hands of, say, a Cathedrals Committee of the Town [or County Council." In concluding, Mr. Massingham says:—"In cathedral towns the tone of provincial life would be immensely sweetened and strengthened by the practical municipalisation of the cathedral. . . . . The cathedral, which is to-day a school of music, might also become a school of art, of architecture, and science. Its walls, adorned with examples of local schools of painting and natural curiosities, would hold within them the elements of the new life, as well as the solemn memorials of the past."

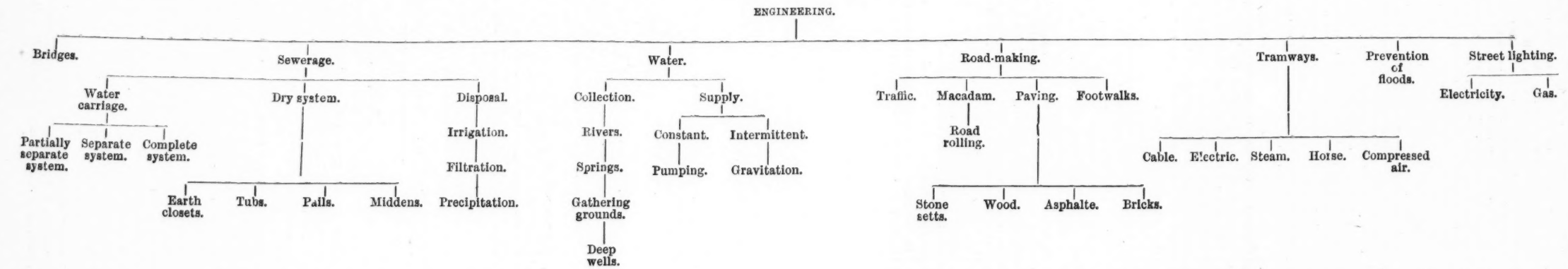
To the *Nineteenth Century* Mr. W. M. Acworth contributes an interesting article on "Railway Passenger Fares." The question of cheap passenger fares has an important bearing on the question of the ever-pressing problem of the healthy housing of the working classes, as was pointed out in Mr. Rowland Plumbe's paper at the recent Congress of Hygiene, reported in our columns last week (see p. 168 *ante*). We quote a few passages from one of the concluding paragraphs of Mr. Acworth's article:—

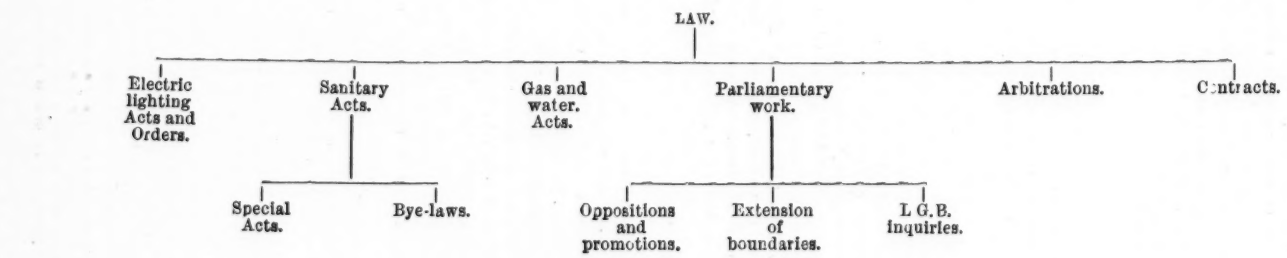
"In their own interest the municipalities would be wise to lighten, as far as in them lies, these burdens. . . . . It has never yet, that I am aware, been proposed that theatre proprietors, or the owners of great shops, should be called on to widen the streets in front of their places of business because of the extra traffic which they bring into the neighbourhood. Yet a railway company is seldom permitted to enlarge its own station without being called on to contribute to the cost of improving the adjacent streets simultaneously. Of course, in one sense municipal pressure of this kind is legitimate enough. The more golden eggs the railway shareholder is goose enough to lay for the benefit of the hard-pressed ratepayer, the better. Railway managers and railway directors can be abundantly trusted to protect their own interests. If, with their eyes open, they undertake to contribute large sums to the cost of municipal improvements, there is no possible reason why they should not be held to their bargain. The question is, whether the bargain for the public is really as good as it looks to be on paper; whether the municipalities do not eat, in the form of contributions to street improvements and borough rates, cake which they might have in a more profitable form of increased suburban service. . . . . If local authorities in this country, instead of striving to exact the last farthing from the railway companies, would endeavour to facilitate to the utmost their development and extension within and near the City limits, they would, I am persuaded, be consulting the best interests of the urban population. . . . . If railway construction can be cheapened, the public will be able to take the benefit, either in improved accommodation, or in decreased fares, as it prefers."

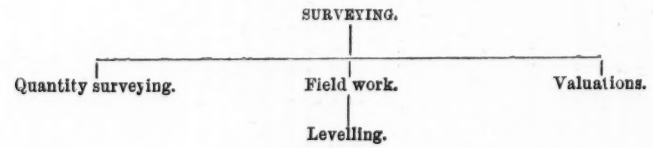
The first article in the *Fortnightly Review* is "On the Origin, Propagation, and Prevention of Phthisis." It is by Professor Tyndall, and consists mainly of an account of the investigations of Dr. Georg Cornet, a German scientist, who "chose for the field of his operations seven distinct hospitals, three lunatic asylums, fifty-three private houses, and various other localities, including private asylums, lecture-rooms, surgical wards, public buildings, and the open street." An important conclusion arrived at by Herr Cornet is that phthisis is not communicated from the sick to the healthy by the aqueous vapour exhaled by consumptive lungs, but that it can be, and *is*, communicated by inhaling air containing dust from the dried sputum of a phthisical patient. "It is universally recognised," he says, "that tuberculosis is caused by tubercle bacilli, which reach the lungs through the inhalation of air in which the bacilli are diffused. They come almost exclusively from the dried sputum of consumptive persons. The moist sputum, as also the expired breath of the consumptive patient, is, for this mode of infection, without danger." The preventive measures recommended are, briefly stated, the provision of proper spittoons for the patients, who must never be allowed to spit upon the floor or employ his pocket-handkerchief to receive his phlegm; and the frequent emptying and cleansing of the spittoons. "In public buildings, as in private

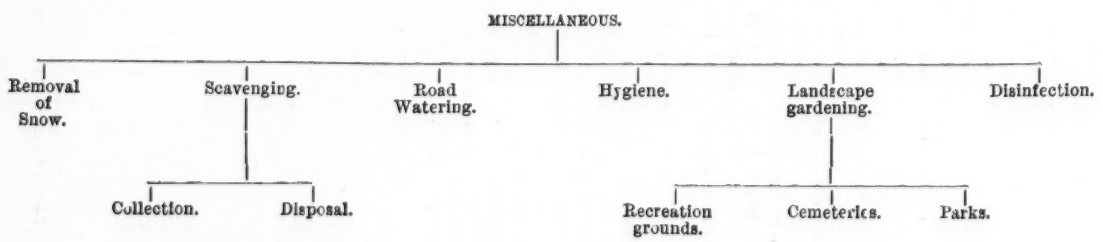
[*Continued on page* 212.

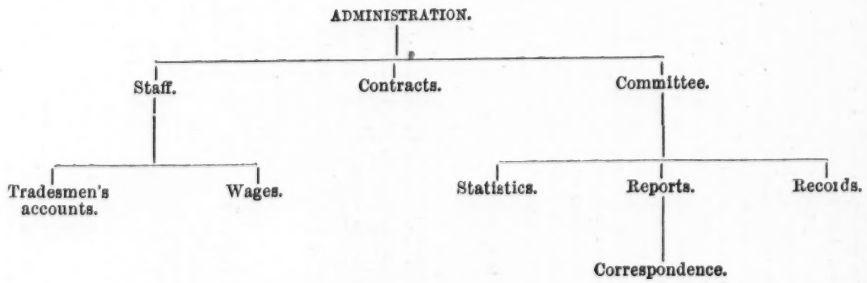
THE SIX CHIEF BRANCHES OF MUNICIPAL ENGINEERING.

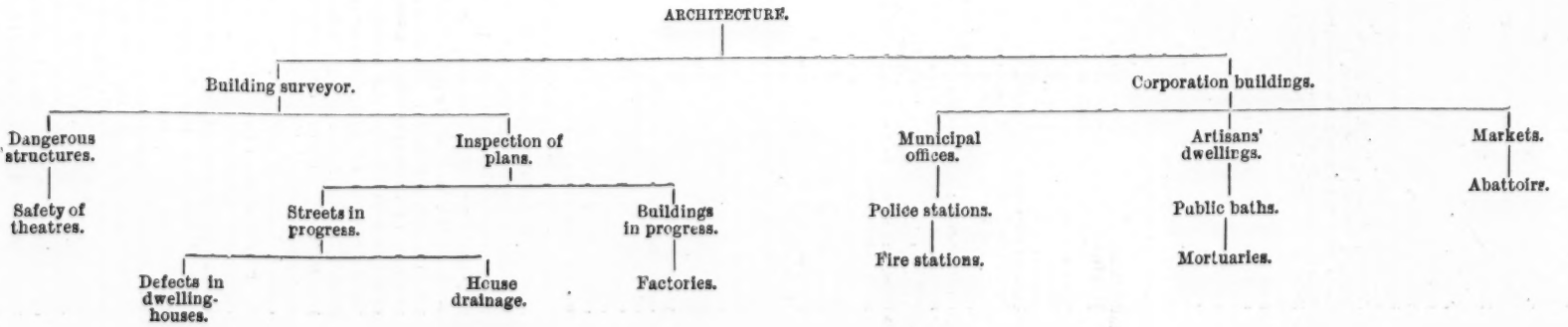












houses, the corridors and staircases ought to be well supplied with these necessaries. The ascent of the stairs often provokes coughing and expectoration, and the means of disposing of the phlegm ought to be at hand. The directors of factories and the masters of workshops, as well as the workmen themselves, ought to make sure that, under no circumstances, shall spitting on the floor or into a pocket-handkerchief be tolerated." The article is one which will well repay perusal by all who have ever given a thought to the means of preventing what has been called "our national scourge."——To the *Fortnightly*, also, Mr. Frederic Harrison contributes "A Survey of the Thirteenth Century." Here are his remarks on the architecture of that notable period:—

"An age which united aspiring intellect, passionate devotion, and constructive power, naturally created a new type of sacred art. The Pointed architecture, that we call Gothic, had its rise, its development, its highest splendour in the thirteenth century, to which we owe all that is most lovely in the churches of Chartres, Amiens, Reims, Paris, Bourges, Strasburg, Cologne, Burgos, Toledo, Westminster, Salisbury, and Lincoln. It is true that there are some traces of the Pointed style in France in the twelfth century, at St. Denis, at Sens, and at Laon; but the true glories of this noble art belong, in France, to the reigns of Philip Augustus and of St. Louis; in England, to those of Henry III. and Edward I. In these two countries we must seek the origin of this wonderful creation of human art, of which Chartres, Amiens, and Westminster are the central examples. These glorious fanes of the thirteenth century were far more than works of art: they were at once temples, national monuments, museums, schools, musical academies, and parliament-halls, where the whole people gathered to be trained in every form of art, in all kinds of knowledge, and in all modes of intellectual cultivation. They were the outgrowth of the whole civilisation of their age in a manner so complete and intense, that its like was never before seen, except on the Acropolis of Athens, in the age of Æschylus and Pericles. It is not enough to recall the names of the master-masons,—Robert de Luzarches, Robert de Coucy, Erwin of Steinbach, and Pierre de Montereau. These vast temples are the creation of generations of men and the embodiment of entire epochs; and he who would know the Middle Ages should study in detail every carved figure, every painted window, each canopy, each relief, each portal, in Amiens, or Chartres, Reims, Bourges, Lincoln, or Salisbury, and he will find revealed to him more than he can read in a thousand books.

Obviously the thirteenth century is the great age of Architecture,—the branch of art which of all the arts of form is at once the most social, the most comprehensive, and the most historic. Great buildings include sculpture, painting, and all the decorative arts together; they require the co-operation of an entire people; and they are, in a peculiar manner, characteristic of their age. The special arts of form are more associated with individual genius. These, as was natural, belong to centuries later than the thirteenth. But, even in the thirteenth, sculpture gave us the peopled portals and the exquisite canopies of our northern cathedrals, the early palaces of Venice, and the carvings of Nicolas and John of Pisa, which almost anticipate Ghiberti and Donatello. And in painting, Cimabue opens in this century the long roll of Italian masters, and Giotto was already a youth of glorious promise, before the century closed."

In the *Westminster Review* for the current month is an article entitled "Side-Lights of the Sweating Commission." It is of present interest now that the Trade Unionists are holding their annual congress. According to the writer ("C. H. d'E. Leppington") there seems to be a pretty general consensus of opinion on the part of witnesses that, with the exception of a few small trades in provincial towns, the whole system of apprenticeship (by which is meant a legally-binding apprenticeship by indenture) is dying out wherever it is not already extinct. The causes of this are discussed, as well as the consequences,—two of which are said to be inferiority of work and a continual tendency to the sub-division of labour, so that what may be called "good all-round" workmen are becoming scarcer and scarcer in many trades. The palliating influence of "Polytechnics" and similar institutions seems to have had no very wide-spread influence so far, if we may accept the correctness of the inferences drawn by the writer of the article after "wading through" the 32,000 questions and answers of which the evidence taken before the House of Lords' Committee consists.

The Gentleman's Magazine contains a very readable article on "John Aubrey of Wilts," by the Rev. B. G. Johns, M.A. Biographical dictionaries, the writer remarks, tell us that John Aubrey, of Kington, in the county of Wilts, was a learned and famous antiquary, an intimate friend of Milton, and a Fellow of that Royal Society which he helped to found. But the dictionaries fail to tell us, says Mr. Johns, that "he was about as credulous an old goose as one could hope to find out of Gotham." Mr. Johns abundantly justifies his assertion by extracts from Aubrey's writings. Mr. C. Parkinson's "Notes on the Lias and Trias Cliffs of the Severn" will be found of considerable interest to readers who are interested in geology. "Some London Streets," by E. K. Pearce, recalls some of the historical and literary associations of Leicester-square, Soho, St. Martin's-in-the-Fields, the Strand, and Fleet-street.

The first article in *Murray's Magazine* is entitled "Calvary and the Tomb of Christ," by the Rev. Haskett-Smith, who comes to the conclusion that the hill outside the Damascus Gate, above the cave known as "Jeremiah's Grotto," is the true site of Calvary.

The English Illustrated Magazine contains two interesting articles of historical and topographical interest. The first is on "Emanuel Hospital, Westminster," by Robert Hunter (illustrations by Philip Norman), and the second is on "Chiswick, Past and Present," by C. J. Hamilton (with illustrations by Mrs. L. Jopling Rowe).

The current number of the *Antiquary* includes a great deal of interesting matter. In one of its "Notes of the Month," it refers to what it describes as "one of the most recent and prevalent frauds on the unwary," viz., frauds in old oak furniture. "The plan is to procure a genuine old chest, chair, dresser, settle, or other piece of furniture, and to carve thereon certain initials, dates, or coats-of-arms, that would materially enhance its value in the eyes of collectors, and particularly of those connected with particular families." Collectors will do well to be on their guard. Professor Halbherr, in "Pompeii Revisited," describes recent excavations on the site of that unfortunate town; and the Rev. Dr. Cox describes and illustrates an interesting sculptured grave-slab in Easington Church, Yorkshire. On it is a floriated cross from the stem of which spring on each side seven large and well-defined oak-leaves.

Of the American magazines, the *Century* for the current month is a good number, and contains several articles of interest. Among them we may name "The Government of Cities in the United States," by Seth Low; "A Painter's Paradise: Play in Provence," by Elizabeth R. Pennell (illustrated by Joseph Pennell); and "Italian Old Masters: Francia, Ghirlandaio," by W. J. Stillman, with notes and engravings by T. Cole.—*Scribner's Magazine* contains an interesting article on "The City of the Sacred Bo-Tree, Anuradhapura," by James Ricalton. This article is illustrated with some well-executed engravings of the dagobas and other buildings. Anuradhapura is a native village in the interior of Ceylon, and it retains the name of an ancient city over whose ruins it is built. "Odd American Homes," by John R. Spears, and "A China-Hunter in New England," by Alice Morse Earle, are both readable and well-illustrated articles.——*Harper's Magazine* has two or three articles of special interest. One of these is Mr. Montgomery Schuyler's "Glimpses of Western Architecture," illustrated by engravings of modern buildings in Chicago by such well-known architects as the late John Wellborn Root (Burnham & Root), the late H. H. Richardson, R. M. Hunt, and others. From certain remarks made by the writer of the article, it would appear that Mr. Richardson's work has been as indiscriminately copied in the States as Mr. Norman Shaw's work has been in this country. An amusing illustration of this is given by a large round-arched doorway, with big voussoirs, dwarfed shafts, and prominent, spreading capitals, which is labelled:—

"JANUA RICHARDSONIENSIS.
N'Importe Qui, Architect."

Mr. Walter Besant's historico-topographical description of "Plantagenet London" is interesting, and is very fully illustrated with representations, more or less authoritative, of the buildings of the period. Many of these have now disappeared.

L'Art for September 1 contains, as its principal feature, an illustrated article by M. Paul Leroi on "La Saison des Ventes Publiques à Londres et à Paris."

The *Revue des Deux Mondes* for August 15 contains the fourth and concluding instalment of M. Victor Cherbuliez's essay entitled "L'Art et la Nature." It is devoted to a consideration of "les doctrines, les écoles, et la personnalité de l'artiste." We quote the following paragraphs, with which the writer concludes his remarks on the contrast between idealism and realism:—

"Idéaliser, ce n'est pas embellir les choses, c'est leur donner du style. Elles en ont souvent, par occasion, par une faveur du ciel, mais elles ne se croient pas tenues d'en avoir toujours, et le besoin de leur en donner ne peut être senti que par un être pensant et capable d'aimer sa raison. Le style, dans le langage des arts, c'est l'esprit de rapport, qui aperçoit le général dans le particulier et le tout dans ses parties; c'est l'esprit de synthèse, qui résume une foule de détails dans un seul qu'il accentue et qui tient lieu de tous les autres. Le style, chez les grands maîtres, c'est l'amour des voies abrégées et rapides, le mépris des petits effets et des petits moyens, une élévation de sentiment qui se révèle par les procédés de l'artiste, une manière généreuse et libre de voir et de dire; c'est le génie, semble-t-il, traitant avec la nature de puissance à puissance, et lui persuadant de préférer à son luxe, à la richesse de son décor, la simplicité qui aggrandit les objets. Si la réalisme délivre l'art des fausses conventions, l'idéalisme le guérit de l'amour des vaines et puériles curiosités. . . .

Le vrai réaliste a son idéal, qui est de donner à son œuvre, par des complications, la plus grand intensité de vie que l'art comporte; le véritable idéaliste a sa réalité préférée, qui est le grand dans le simple. L'un et l'autre représentent un certain genre de vérité; car, s'il est vrai que toutes les choses nous paraissent infiniment complexes, il n'est pas moins vrai qu'elles se simplifient pour celui qui les regarde de haut comme pour celui qui en voit le fond."

To the same *Revue* for September 1, M. Gabriel Séailles contributes an interesting article entitled "Léonard de Vinci, savant, sa Méthode et sa Conception de la Science." The writer maintains that the distinguished Italian master was far in advance of his age in regard to science, and that he anticipated the Baconian philosophy:—

"Cent ans avant le chancelier Bacon, le Vinci trouve et formule la vraie méthode scientifique en notant les démarches de son libre et vaillant esprit. Que veut Bacon? Une science efficace, dont les découvertes mettent au service de l'homme les puissances de la nature, connaître les causes pour produire les effets. Le respect superstitieux de l'autorité est l'obstacle que d'abord il renverse; l'expérience est la méthode positive qui, par la comparaison des faits, dégage les formules fécondes. Léonard va au même but par la même voie. Il ne sépare pas la théorie de la pratique, il rejette l'autorité, il préconise l'expérience. Mais il ne passe pas son temps à décrire le procédé et à en vanter l'excellence. Il a hâte de se mettre à l'œuvre. L'exposé de la méthode n'est pour lui qu'une préface, qu'une introduction: il la voit clairement, il l'indique brièvement, il la pratique en maître. Il ne s'attarde pas à dire ce qu'il faudrait faire, il le fait."

La Nouvelle Revue for September contains M. Édouard Garnier's second and concluding article on "La Manufacture de Sèvres pendant la Révolution." These articles form an exceedingly interesting history of the famous establishment at Sèvres during the troublous times of the Revolution. From a letter written by the director, M. Salmon, it appears that at one time 250 artists and workmen employed at the establishment were in great distress and in want of the barest necessities of life, and it looked as though the establishment would be broken up and the artists and workmen dispersed. In his concluding paragraph the writer says:—

"La Manufacture de Sèvres a eu, depuis le commencement du siècle, bien des mauvais jours à traverser et souvent son existence a été menacée. Jamais, cependant, elle ne fut aussi près de sa perte que pendant les dix années dont nous avons cherché à retracer l'histoire. Si elle fut sauvée, c'est, ainsi que nous l'avons vu, grâce à la fermeté des ministres et des savants qui l'avaient prise sous leur patronage et qui avaient compris qu'elle était une des gloires artistiques les plus pures léguées à la France par l'ancien régime, grâce au dévouement et à l'abnégation de ses admirables artistes qui avaient confiance dans l'avenir et qui aimaient cette maison dans laquelle beaucoup d'entre eux étaient nés et où ils avaient vieilli; grâce aussi à l'initiative énergique de Costaz et à l'intelligente direction de Brongniart. C'est lui, ainsi que nous l'avons dit précédemment, qui, avec un courage et une persévérance que l'on ne saurait trop admirer, et malgré les embarras financiers et l'inertie administrative auxquels il se heurta dès le début, sut lui imprimer ce grand caractère d'école d'art céramique qui, sous son administration, a rendu de si grands services à la science et à notre industrie nationale, et qu'elle doit chercher à recouvrer sous peine de n'avoir plus aucune raison d'être."

Books.

The Stonemason and the Bricklayer. By various Practical Writers. Edited by the Editor of "The Industrial Self-Instructor." London, New York, and Melbourne: Ward, Lock, & Co. 1891.

BASED upon the series of articles which have appeared in "The Industrial Self-Instructor," under the heads of "The Stonemason" and "The Bricklayer," to which further information has been added, this book is intended to form a manual of instruction in the technique of the important building trades with which it deals, and at the price (5s.) at which it is published is a desirable addition to the library of the young architect, engineer, or builder, who can read with discretion, and supplement its deficiencies, and correct its mistakes by comparison with other works and practical observation. The volume commences with an account of various methods of constructing walls of stone, starting

with rubble and advancing to ashlar. In this part of the work it is to be regretted that the technique of walling and the principal terms describing it are not more fully explained. For example, such a sentence as this "There are different modifications of rusticated or rough-faced wall, known as 'rough-faced,' 'frosted,' and 'sparrow-pecked' work, &c., &c." (*sic.*), is unworthy of a serious account of "The Stonemason as a Practical Worker." The technology of masonry, and especially of walling, is a subject which at present takes years of experience to acquire, and the value of the book would be largely increased if a clear account were given of the description of work meant by "frosted," "sparrow-pecked," &c., &c., besides others not mentioned as "snail-creep," "vermiculated," "perfect ashlar."

The subject of bond in masonry is fairly well treated, though sufficient stress is not laid on the precautions that should be adopted in building walls of heterogenous structure.

Slight, though popular, inaccuracies in technology are occasionally present in the pages of the work; thus the true distinction between a "chamfer" and a "bevel" is confused, while the window-sill shown in fig. 34 as "weathered" should be more correctly termed "sunk weathered."

The account given of the connexion of stonework by means of joggles, dowels, cramps, and bolts contains information not generally found in text-books, but does not attain that completeness which might be expected.

The section on "The Shape or Configuration of Stones as forming part of the Architectural Style or Design of a Structure" is unfortunate, and needs re-writing by an architect, with entirely fresh illustrations from fig. 63 to fig. 104. The mouldings shown are feeble beyond conception, and would scarcely pass muster in the days of Batty Langley, much less in the last decade of the nineteenth century. Not only is the design utterly bad, but the construction is in many cases,—as, for example, in figs. 72, 73, and 76,—quite unsuited for stonework, unless it were the desire of the builder to bring his work to the condition of an interesting ruin as speedily as possible. The young student would do well to remove pages 56 to 88 from his copy, or, at least, to persistently ignore their contents. The paragraphs on the cutting of complex forms of stonework that next follow are well treated, and worthy of study.

A further section, apparently by a different writer, deals with foundations in a fairly satisactory fashion, but we must take exception to the illustrations of concrete foundations of wedge-shaped form, that would be likely to lead to uneven settlement, instead of carefully-cut horizontal beds and vertical sides.

A good account of the general principles determining the composition and the durability of the materials of the stonemason, stones, lime, mortar, and cement, concludes the portion of the book devoted to that craft.

The introductory portion of the section of the work dealing with "The Bricklayer" is chiefly occupied with generalised speculation on the history of brickwork and argumentative comparison of the superiority of brick to stone. The account of the making and the classification of bricks lacks both completeness and accuracy, the distinction between malm and stock bricks being especially vague and unsatisfactory, while the writer's philology is even ludicrous. The description of bond in brickwork chiefly deals with Flemish, and what the author calls "Old English," while some account is given of varieties of diagonal bond. The merits and defects of various kinds of bond are not pointed out as they should be, while that the extent of the writer's knowledge is evidently limited is shown by the fact that he seems to be unaware that the variety of bond shown in fig. 43 is properly known as English garden-wall bond, to distinguish it from what he calls "garden-wall bond," which should be Flemish garden-wall bond. We have hitherto noted deficiencies merely in the description of "the bricklayer's" work, but more serious faults exist in the illustrations of foundations and of hollow walls. The methods shown are both utterly bad in principle, and we are glad to say, unusual in practice. The usual and correct way of building hollow walls is, indeed, not even mentioned. The account of pointing, too, is faulty, not only in its omissions, but absolutely wrong in its explanation of terms as generally used.

As a supplement to other works, the book may be of value to the student, but we should certainly not recommend it to any one as the only, or even as the principal, source of information on the work of "The Stonemason," and still less, very much less, on that of "The Bricklayer."

Sewer Ventilation and Sewage Treatment. By R. HARRIS REEVES. London: Sinclair, Tweedie & Co. 1890.

THIS is a pamphlet, with numerous illustrations, written to show the inadequacy of ordinary systems of sewer ventilation and the advantages of the author's system of dealing with sewer-gas. The writer's theory, based upon his own experiments, is briefly this: firstly, the air of the sewers being in contact with water, the ordinary law of the diffusion of gases is inoperative; secondly, the sewer air is, therefore, not being constantly exchanged with the oxygenated atmospheric air, but simply rises and falls, as the pressure and the sewage level vary; therefore the ordinary methods of sewer ventilation are inefficient, and sewer-gas, of a deleterious nature, is formed and discharged at irregular intervals. The author, therefore, adopts a chemical treatment, and by the reaction of manganate of soda and sulphuric acid evolves free oxygen to deodorise the sewer-gas, and permanganic acid to disinfect the sewage. The author's system has been fairly tried at Frome, Somerset, and elsewhere, with, it is asserted, satisfactory results. Mr. Reeves does not give any particulars as to the expense of his system, but immunity from disease is hardly to be too highly purchased.

Patents for Inventions, and How to Procure Them. By G. G. M. HARDINGHAM. London: Crosby Lockwood & Son. 1891.

THIS little book contains only forty-one pages of the treatise, but it is remarkable that three pages of preface are required to introduce the work to us. The book is nothing more than a short descriptive essay on the above subject. The object of the book appears to be simply to give just so much information as will enable a would-be patentee to understand to some extent what his agent is talking about. It is too slight to be of any real value.

Correspondence.

To the Editor of THE BUILDER.

THE FAMILY OF SIR C. WREN.

SIR,—Having been lately engaged upon a list of the works by this great architect, I soon found that little was known by the early writers of the marriages and children. As I have these now arranged, perhaps the result may not be considered unworthy of insertion in the pages of the *Builder*. Its completeness is chiefly due to the insertion in *Notes and Queries* for 1878 of a question by Miss Phillimore, previous to the publication in 1881 of her work, "Sir Christopher Wren, his Family and his Times, 1585-1723," which work has one blemish, that of accepting as a fact the very pretty romance of the young carver (p. 253), which was written by Walter Thornbury, I think, for *The British Workman* magazine in 1877, who quoted, as the authority for it, "a manuscript in the British Museum!" which has not been identified.

Sir C. Wren married Faith, daughter of Sir John Coghill, of Bletchingdon, Oxfordshire, on December 7, 1669, at the Temple Church. A son, Gilbert, was born, 14th, and baptised 26th October, 1672, at the Church of St. Martin's-in-the-Fields. He was buried there, March 23, 1673-4.

A son, Christopher, born 16th or 18th, was baptised 19th February, 1674-5, at the same church.

Faith was buried September 4, 1675, in the same church.

This Christopher outlived his father, died August 24, 1747, aged 72, and was buried in Wraxhall Abbey Church, which his father had bought as late as 1713. He married, May, 1706, Mary Musard, who died December 10, 1712, and was buried in the crypt of St. Paul's Cathedral. They had a son, Christopher, born May 5, 1711. He then, Nov. 8, 1715, married Lady Constance Burgoyne, who died May 23, 1734. They had a son Stephen, born May 14, 1722, who published the *Parentalia*.

Sir Christopher's second wife was Jane, daughter of William, Lord Fitzwilliams, baron of Lifford in Ireland. They were married in the Chapel Royal in St. James's Palace on February 24, 1676-7. They had a daughter Jane, baptised November 13, 1677, in the Church of St. Martin's-in-the-Fields, died December 29, 1703, aged 26, and buried in the crypt of St. Paul's Cathedral; and a son, William, born June 16, baptised 18th, 1679, and died March 15, 1738-9. Jane, the wife, was buried in the Church of St. Martin's-in-the-Fields, October 6, 1680.

Sir Christopher Wren died on Monday, February 25, 1723, aged 91; and, needless to add, he was buried in the evening of March 5, in the crypt of St. Paul's Cathedral. At that time he was living in St. James's-street and at Hampton Green. The family used the old Church of St. Martin's-in-the-Fields, being contiguous to his official residence in Whitehall, which he held during his appointment as Surveyor-General, up to April 26, 1718, unless he was burnt out in the fire of 1697.

August, 1891. WYATT PAPWORTH.

"ENGLISH ARCHITECTS IN AUSTRALIA."

SIR,—Under the above heading, in your issue of April 18, a correspondent, signing himself "An Englishman," takes exception to your remarks concerning those who, as professional failures in the Old World, regard this "new country . . . . as a place where they may try again."

It is not for an Australian to support such an assertion as this, for your opportunities of gauging the feeling of Englishmen in the matter are necessarily much greater than ours; and though it may be considered that self-interest distorts our views of the question, you, who contemplate it with English eyes, can scarcely be accused of prejudice. Moreover, it seems highly improbable that the Editor of the leading professional journal would commit himself to such a statement unless he were thoroughly assured of its veracity.

However, it is only with the last paragraph of "An Englishman's" letter that I wish to deal; though I must premise by saying that your correspondent hopelessly confuses the question at issue by protesting in his patriotic indignation on behalf of his fellow-countrymen. Fully three-fourths of those in practice here claim Great Britain as their birthplace; but the reference, as I read it, is not to men of English birth, but to those English architects who, having entered the "over-crowded arena at home," find it advisable,—from whatever cause,—to make their escape from the crush.

But it is to such men as these your correspondent would lead your readers to infer that we are,—or are to be,—indebted for all the much-needed reforms in our professional practice; whereas the only serious effort in this direction has emanated from the local Institute of Architects, which does not, as far as I can learn, number any gentlemen of this class among its members.

In fact, the English architects in practice here have been generally regarded as inimical to the Institute; and it is a pity, therefore, that they should have kept secret so long their laudable endeavours to raise us from the mire of our professional degradation to the proud standard they are so desirous to maintain.

AN AUSTRALIAN.

Sydney, July 4, 1891.

SAFETY OF FACTORY EMPLOYES IN CASE OF FIRE.

SIR,—Under the Factory and Workshops Act, 1891, section 4, which comes into force on January 1, 1892, all factories in which more than forty persons are employed have to be furnished with a certificate from the Sanitary Authority of the district in which the factory is situated, that the factory is provided on the stories above the ground floor with such means of escape in case of fire for the persons employed therein as can reasonably be required under the circumstances of each case. As far as I can ascertain, the authorities have not made any regulations. As the subject is of great importance, I venture to call the attention of our profession to it, and to suggest that an endeavour be made to obtain uniform regulations for the administration of the Act, for the guidance of the authorities, and the owners of such properties or their professional advisers. The Act makes the owner, and not the occupier, responsible for the provision of the alterations

which may be required, before the certificate is granted.

In the application of this section to the Administrative County of London, the London County Council takes the place of the Sanitary Authorities. HERBERT D. SEARLES-WOOD.

157, *Wool Exchange, E.C.*

[Our correspondent's suggestion is well worth attention. The Act cannot fail to be of great value if properly administered. We know of places where large numbers of men are employed without any means of escape from the upper floors in case of fire.]

A DEATH-TRAP.

THE west entrance to St. Albans Abbey Church and Cathedral comprises north and south aisle doors, each 3 ft. 9 in. wide, and two centre aisle or nave doors, each 3 ft. 3 in. wide, all of which open *inwards*, and are besides bevelled so as to wedge in the rebates upon pressure from the inside. Within the central pair is a temporary screen which, in a panic, would crush back upon, and effectually block, both central doors. About 10 ft. from this screen are five steepish steps the full width of building.

The average Sunday evening congregation is about 2,000, and in an ordinary way, takes a very considerable time to pass out. In case of fire, or an alarm, the great majority of those present would certainly hurry to the above doors, and it is hardly necessary to mention loose chairs and hassocks in addition to the steps, to suggest how easily a catastrophe might occur in the pit between them (the steps) and the doors.

It is fair to say there is another door at the east end of the south aisle, though it is comparatively little used; and, *per contra*, there are no extra fire or panic exits whatever. RESIDENT.

"RUSHES AS A KEY FOR PLASTERING."

SIR,—Referring to Mr. Henry Lovegrove's letter in your Journal of the 5th inst. (p. 194), I believe the rushes referred to were much used in buildings erected 100 to 150 years back to *prevent sound*. I remember reading of the destruction by fire of an ancestral mansion in the Eastern counties in which rushes were so employed, and to these was attributed the destruction of the building, although I am inclined to think it might more appropriately have been put down to the want of an efficient fire-engine. J. C. MERRYWEATHER

Greenwich, September 7.

STABLE DRAINAGE.

SIR,—In the last number of your paper (p. 194) appears a letter from Messrs. Cottam & Willmore directing attention to a paragraph in your issue of August 22, in which Mr. Ward's system of stable drainage is described, and alleging that his system is but a copy of one introduced by them "some five or six years ago."

It may interest your readers to know that this system of avoiding "all traps in the stable" is of much greater antiquity, for in an early edition (1862) of "The Horse in the Stable and the Field," the well-known author, "Stonehenge" (the late Dr. Walsh), states his objections to all internal traps, saying, "hence it is that I would exclude all internal traps," and he then describes how these can be done away with by using the iron gutters manufactured at the St. Pancras Iron Works.

Shortly after this appeared Major-General (then Colonel) Fitzwygram's book, "Horses and Stables," in which the author, condemning the use of underground drains in stables, advocated the adoption of surface drains emptying themselves outside the stable walls.

I also described and recommended the system in a little treatise, "Stables and Stable Fittings," published by the St. Pancras Iron Work Company in 1870, its utility having in the interim been practically tested; and I can myself remember several large stables drained in this way twenty-five to thirty years ago.

In a pamphlet on paving and draining, published in 1881 by the St. Pancras Iron Work Company, the same system is fully discussed; and in the last edition (1890) of "The Horse in the Stable and the Field" it is also described and enlarged upon.

It is therefore plain that this system has been before the public for the last thirty years, and is quite familiar to any one competent to advise on such subjects. RUSSEL ELLIOT.

St. Pancras Iron Works, London, N.W.

SIR,—Your issue of the 5th inst. contains a letter from Messrs. Cottam & Willmore, in which they suggest I am selling their manufactures. I beg to state such assertion is quite untrue. I have known Messrs. Cottam & Co. as general hardware manufacturers for the last twenty years, but not as sanitary engineers. Where open concrete channels can be used in a stable iron gutters are a mistake. My system does not include for iron gutters, so I cannot have copied theirs; my system being as follows:—Inside stable-pots, which will not hold urine to smell and generate ammonia, but which prevent straw, &c., getting into the drains, a specially-designed intercepter, fixed outside, which is ventilated and so arranged as to prevent draught in the stable, and give ready access to the drains in case of stoppage. A. J. B. WARD.

The Student's Column.

MARBLES.—XI.

HAVING briefly described the nature of the colouring matter of marbles in general, we will now say something concerning the colour of the minerals which form integral parts of them, and which so frequently influences the general tints of the stones.

The colours of minerals are either essential to them, as in the sulphides, oxides, and "acidiferous" compounds of most metals, and in those species of which they are essential constituents; or they are the effect of a casual intermixture of these substances in species, which, when pure, are naturally colourless. Of the latter sort are the colours of felspar, calcspar, pure crystalline marble and jasper, in which the various tints of red and yellow are generally due to the oxide and hydrous-oxide of iron. Other minerals derive a brilliant green colour, some from carbonate of copper, others from the oxide of nickel, or of chrome. In species of which the colour is a permanent character*, its intensity is often so far varied by a difference of texture, or a confused crystallisation, that red, brown, and green substances appear, in a mass, to be black; but on being pulverised their true colour is seen. The intermixtures of colouring matter, which are merely mechanical, render a mineral more or less opaque; thus the red and yellow jasper already mentioned, and which are frequently found in breccia marbles, are chalcedony (which, when pure, is highly translucent, or even semi-transparent), coloured by minute particles of oxide of iron, which are themselves opaque. But colours which, though they may not be essential to a species, are the result of chemical combination, do not impair its transparency.

Referring to accidental colours, Mr. Ramsay says that, being unequally distributed, they often produce parallel bands, either straight or curved, and clouded forms; sometimes the colour runs through the mass in veins, as in marble. In some minerals a peculiar light is produced, either by friction or by heating them, which is called phosphorescence. On rubbing together two fragments or pebbles of quartz, a faint greenish light will be perceived; the same effect can be produced with certain marbles.

The colours of even the same species of mineral vary greatly, so that colour alone does not serve to identify them. But it is found that many minerals are usually of definite tints, or that they vary within certain limits; again, the colours commonly presented may be stated, and are often useful in conjunction with other features in enabling us to determine the species of mineral to which they appertain. For instance, quartz is colourless, or white, but it is also found of pinkish and yellow, brown and amethystine colours, and sometimes quite black; yet this diversity does not preclude us from recognising the fact that in the vast majority of instances, quartz is white, clear, and transparent, and has a glassy lustre, and in this state it most frequently occurs as crystals, and in veins in the harder polished ornamental stones. Now and then it presents a smoky appearance.

Some minerals, when turned about or looked at in different directions, display a changing series of prismatic colours, such as we see in the rainbow, or on looking at the light through a glass prism. The minerals of certain kinds of ornamental stones effect what is termed a "change of colour" over broad surfaces, the succession of colours taking place slowly as the specimen is turned, or the spectator changes position. Labradorite is an excellent example of this phenomenon. Stones which possess this mineral rank amongst the more beautiful materials in the stone and marble market. Iridescence may sometimes be seen in specimens of quartz, calcspar, and mica.

Some minerals tarnish on exposure to the air.† This may result either from oxidation or from the chemical action of sulphur and other elements, which are generally present in the atmosphere in minute quantities and in various states of combination. Tarnish may be distinguished from the true colour of the mineral by chipping or scratching it, when the superficial nature of the tarnish will be at once revealed. Sometimes tarnished minerals exhibit iridescent colours. Specular iron and copper pyrites, which may occasionally be seen in small quantities in ornamental stones, frequently afford good examples of the iridised tarnish.

There is another property possessed by many of the common minerals found in marbles, and which may be conveniently alluded to at this stage, viz.:—lustre. This, as might naturally be supposed, materially influences their general appearance. A mineral of a certain colour, and bright and vitreous in lustre, will look very different from another of the same colour, but which is dull and earthy. It is recognised that there are six kinds of lustre, the description of which we may conveniently abridge from Mr. Rutley's work*, as follows:—

1. Metallic.—The ordinary lustre of metals. When, however, it is but feebly displayed, it is termed sub-metallic. Iron pyrites (a common constituent, unfortunately, of many marbles) afford a good example of metallic; chromite, of sub-metallic lustre.

2. Vitreous.—The lustre of glass. When less perfect it is termed sub-vitreous lustre. Quartz and sanidine felspar are examples of vitreous; and calcite (commonest of all marble-forming minerals) of sub-vitreous lustre.

3. Resinous.—The lustre of resin, such as is exhibited by opal, amber, &c.

4. Pearly.—Talc, selenite, &c.

5. Silky.—This lustre is peculiar to minerals having a fibrous structure, like gypsum (alabaster). Asbestos may be cited as affording a good example of silky lustre.

6. Adamantine.—Resembling the lustre of a diamond.

Many minerals being of an earthy texture are without lustre, or quite dull.

We are now in a position to describe the colour, general appearance, and mode of occurrence of the commoner forms of minerals found in marbles; and we shall allude also to the kinds in which they are usually found.

QUARTZ. — Chemical composition,— silica; colour,—white, pinkish, yellow, brown, claret, and smoky black. It is abundant as an original constituent of ornamental rocks, as in granite and quartz porphyry; and as a secondary mineral, wholly or partially filling veins and little cracks and cavities. When a marble has many quartz veins in it, it is usually tooled and worked with difficulty. Rose quartz, as its name implies, is a rose-coloured variety; the colours fade on exposure, but may be restored on moistening.

JASPER.—This mineral is an impure, opaque form of silica, commonly of vivid red colour, but sometimes brown and yellow. Some kinds are beautifully banded with different shades. It occurs in several breccia marbles, being very conspicuous on account of its brightness. Beds of ferruginous jasper, often finely clouded, occur in Canada, which, at one locality, at least, are traversed by veins of chalcedony (a mixture of true quartz with hydrous or opal-quartz). Jasper pebbles of various colours abound in conglomerates of the older rocks. It is common in certain parts of Ireland also. A fine bed of red jasper is found on the eastern shore of Loch Lomond, north of the Pass of Balmaha. Fine specimens of riband and other jaspers are obtained from the river Korgon, in the Altai, and Orenburg, in Siberia. In the mountains near the river Korgon is a bed of jasper 300 ft. in thickness, resting on a mass of porphyry.†

LYDIAN STONE.—Is an impure, carbonaceous, flint-like stone of a dark or blackish-green tint. It exists in certain breccia marbles.

CORUNDUM.—Chemical composition, alumina, or aluminic oxide. The common varieties of this mineral are grey, greenish, or reddish; occasionally colourless. It has a vitreous lustre, but the surfaces of the crystals are usually more or less dull. In its crystalline state it is remarkable for its hardness and durability. It is generally mixed with minute quantities of other oxides, which impart to it certain colours. Corundum is found in the most highly crystalline rocks, such as granites, syenites, gneiss, &c., but it is particularly abundant in many serpentine marbles and rocks of metamorphic origin.

* Consult on this subject the excellent treatise by Alex. Ramsay, on "Mineralogy," 1868, pp. 46 *et seq.*
† Rutley, "Mineralogy," 1876, p. 24.

* Rutley, *op. cit.*, p. 25.
† Hull, "Building and Ornam. Stones," 1872, p. 178.

TOURMALINE (Schorl).—In chemical composition this mineral is very variable. Mr. Rutley remarks that all kinds contain silicate of alumina, with about 4 to 10 per cent. of boracic acid; some iron, either as peroxide or protoxide, or both; magnesia, lime, and soda in variable proportion; and sometimes a little lithia, traces of phosphoric acid, and 1 to 2 per cent. of fluorine. Generally, tourmaline may be considered to be a boro-silicate of aluminium and of magnesia, soda, or lithia. The alumina may be partially replaced by ferric oxide, whilst the magnesia and soda may be partially replaced by ferrous oxide, or the protoxide of manganese. The mineral is usually black, or bluish-black, more rarely blue, green, and red, and very rarely colourless. It is a common constituent of crystalline limestones, and other rocks, such as granite, gneiss, and dolomite. In its ordinary black form (schorl) it is especially conspicuous in several ornamental stones.

SANITARY AND ENGINEERING NEWS.

NEW RESERVOIR, MARSDEN, YORKSHIRE.—On the 27th ult. the first sod of the new Butterley Reservoir, one of a series constructed in the Wessenden Valley above Marsden, was cut by Ald. James Crosland, Vice-chairman of the Waterworks Committee of the Huddersfield Corporation. The new reservoir will cover 41½ acres of land, and will contain, when full, 400,000,000 gallons of water, and will make the eighth reservoir now belonging to the Huddersfield Corporation The construction of the Butterley Reservoir was planned by the late Mr. John Stanway, who had to a large extent the superintendence of the construction of Blackmoorfoot Reservoir, which will hold 700,000,000 gallons. The work will be carried out on the lines laid down by Mr. Stanway, and Mr. J. E. Hughes, of London, will superintend the work.

SEWERAGE OF SOOTHILL NETHER, NEAR DEWSBURY.—On the 24th ult. the first sod of the drainage scheme about to be carried out by the Soothill Nether Local Board, was cut by the Chairman of that body, Mr. J. A. Taylor. The place where the sod was cut is at the outfall at Scarr End Mills. The engineer of the works is Mr. Malcolm Paterson, C.E., of Bradford; and Mr. Clarke, of Sheffield, is the contractor.

GENERAL BUILDING NEWS.

ALTERATIONS, NOSELEY HALL, LEICESTERSHIRE.—This ancient mansion, the property of Sir Arthur Hazlerigg, Bart., and which is of great historical interest, having been used by Oliver Cromwell as his headquarters in Leicestershire before setting out to destroy Ashby Castle, is, we hear, now undergoing extensive alterations and additions from the designs of Mr. J. Macvicar Anderson, P.R.I.B.A. The builders are Messrs. Treasure & Son, of Shrewsbury.

UNITED PRESBYTERIAN CHURCH, PEEBLES.—The foundation-stone of a new church for Peebles West U.P. congregation was laid on the 5th inst. The new building, which is to take the place of an older and less convenient one, will occupy a site known as Blinkbonny, at the foot of the Old Town and Elcho-street Brae. The building will be in the thirteenth century Gothic style of a simple type. There will be accommodation for about 640 sitters, and a hall adjoining will be seated for 300. The cost of the structure will be about 2,800*l.*, and with the site about 800*l.* more. The architect is Mr. Robert Murray, of Edinburgh.

WESLEYAN CHAPEL, ROCK FERRY, CHESHIRE.—The memorial stones of a new Wesleyan chapel were laid at New Ferry on the 3rd inst. The chapel is being erected on a site containing about 1,500 square yards, fronting the main highway from New Ferry to Bebington, and has accommodation provided on the ground-floor for about 530 adults in nave, transepts, and chancel. Two main entrances have been arranged, one by the octagon porch to the left, and the other by the tower porch to the right. The chancel is fitted with side pulpit and choir stalls, provision being made for communion table, &c., on a raised platform. The transepts have been so arranged that by means of revolving screens they may be shut off from the chapel and so form class-rooms of ample dimensions. In addition to these class-rooms, a minister's vestry, with lavatory accommodation, has been provided at the rear. The scheme includes future school buildings at the rear, with accommodation for about 450 children in school and class-rooms. The internal woodwork and fittings will be of pitch-pine varnished, and the external woodwork will be red pine, painted four coats. The heating will be by hot-water pipes, and the ventilation by means of patent exhaust cowls. The windows will be filled with lead cathedral lights. A large traceried window has been designed in the front gable, and all the chapel windows have enriched tracery heads. The buildings, except the rear elevation, are faced with red rock-faced sandstone from Helsby, and the window and door dressings, &c., are of Runcorn stone. The roof will be slated with best slates in alternate red and blue bands. The contract for the chapel portion of the scheme is being carried out by Messrs. Kelly Bros., of Walton, for the sum of 2,275*l.*, from the designs and under the superintendence of Mr. Thomas W. Cubbon, architect, of Birkenhead, whose plans were selected in a limited competition.

EXTENSION OF ABERDEEN FISH MARKET.—Aberdeen Fish Market is, according to a resolution of the Town Council on the 7th inst., to be extended eastwards along Commercial-road for a further distance of 250 ft. The full length of the market will then be 1,000 ft.

UNITED PRESBYTERIAN CHURCH, KILSYTH, STIRLING.—On the 7th inst., Mr. Stewart Clark laid the foundation-stone of a new church, which is being built for the members of the United Presbyterian denomination at Kilsyth. The new church, for which plans were prepared by Mr. Alexander Petrie, architect, Glasgow, occupies a site overlooking the Kingston-road. The style of architecture is Gothic, of the Early English period. The interior of the building will be divided into a nave 60 ft. long by 30 ft. wide, and side aisles each 9 ft. 6 in. in width, along which there are to be pointed arches, supported on columns with moulded capitals and bases. The ceiling, which will be semicircular in shape, will be divided into panels by moulded ribs springing from corbels over each of the columns. The roofs of the aisles will be treated in a similar manner with pointed mouldings. A gallery will run round three sides of the church, which altogether will accommodate 660 sitters. A hall seated for 320 persons, with a session-house and vestry on either side, are also being erected. The whole cost will be upwards of 3,000*l.*

RESTORATION OF KIRBY MUXLOE CHURCH, LEICESTERSHIRE.—The re-dedication of the church of St. Bartholomew's, Kirby Muxloe, took place on the 3rd inst. The tower has been completely restored, a new drain has been laid round the outside of the church, the walls inside have been replastered, the wood in the roof has been re-stained, and the seats have been renovated. The work has been carried out from the designs of Mr. Stockdale Harrison, by Mr. Mason, Kirby Muxloe.

PUBLIC BATHS, BATLEY.—The Local Government Board having sanctioned the borrowing of the money necessary for their completion, some public baths are about to be erected at Batley. Building operations will be commenced forthwith, for the plans were prepared many months since by Mr. Walter Hanstock, architect, Batley. The site selected for the baths is on the Market Estate, between Cambridge-street and Wellington-street. The building will front to Cambridge-street, and its dimensions will be 126 ft. by 134 ft. For the most part, the premises will be one story high. There are to be two swimming-baths, first and second class. The latter will measure 91 ft. by 49 ft., with a water measure of 75 ft. by 30 ft. Dressing-boxes will be arranged on three sides, and above these there is to be a spectators' gallery. The first-class swimming-bath is to be on the Wellington-street side. There will be a water measure in this of 63 ft. by 25 ft. Arrangements have been made for twenty second-class and ten first-class slipper-baths, with necessary appurtenances. Provision will be made for a set of Turkish baths, with a cooling and dressing room, a first hot-room, second hot-room, a small third hot-room, and a shampooing-room. Glazed bricks are to be used very extensively. It is estimated that the cost will come within the sum of 10,000*l.*, which it was originally decided to spend over the baths.

HERNE CHURCH, KENT.—The parish church of "Olde Hearne," as a fifteenth-century writer called it, has just had its restorations completed by the addition of a new roof to the north aisle. In 1853, new roofs were placed on the nave and south aisle, and the church was reseated also from the designs of the late Mr. Hakewill, architect, the contractor being Mr. H. B. Wilson, of Canterbury. The work consisted in the taking down of an ugly "lean-to" roof, erected in 1778,—as appeared by a date on one of the old rafters,—and erecting a new open timbered roof of fifteenth-century type, and low pitch. The new roof is of Jarrah wood, from Western Australia, which has a deep rich tone, resembling mahogany. The new roof is panelled and carved, to which purpose the new wood lends itself readily, it being as hard as oak, but free from knots. The east gable of the north aisle has been restored in Chilmark stone, and a niche has been formed for a sculpture subject, viz., the "Baptism of Our Lord," an ancient altar in the Mille's Chapel below, having been dedicated to St. John the Baptist. There was also another altar to the Blessed Virgin. The emblems of both saints will be carved on the gable over the respective altars. This portion of the work is in the hands of Mr. N. Hitch. The whole of the work generally has been carried out by Mr. H. B. Wilson, from the designs of Mr. Francis Butler, architect.

NEW OPERA HOUSE, SOUTHPORT.—This building has been completed and opened. The opera house is situate between the Lord-street Railway-station and the Winter-gardens entrance, and has a frontage to Lord-street. The work was commenced in October last from the designs of Mr. Frank Matcham, architect, London. The elevation to Lord-street is of mixed Flemish design with Moorish octagonal turrets surmounted by domes and finials made by Messrs. Fambrini & Daniels, of Lincoln, in their "Imperishable Red Concrete Masonry." The façade is of red brick relieved with modelled art panels emblematic of Music, Poetry, Art, and the Drama. These, together with the moulded cornices, string-courses, animal grotesque corbels, scroll-work to gables, &c., being of the red concrete before mentioned. The turrets act as ventilators to various parts of the building. The theatre is lighted by the Swan electric light. Over the main entrance is a balcony, at the back of which is an elaborately modelled screen in red concrete, consisting of five pilasters supporting semi-circular panels, enriched with appropriate ornament. Between these are three medallion portraits in full relief of Shakespeare, Garrick, and Beethoven. The whole of the screen and portraits were modelled and produced in their red concrete masonry by Messrs. Fambrini & Daniels, Lincoln. The general contractors for the erection of the building were Messrs. R. Neill & Sons, of Manchester, and the total cost, exclusive of site, has been about 20,000*l.*

FOREIGN AND COLONIAL.

FRANCE.—Workmen occupied in constructing a reservoir in the Rue Malebranche, near the Panthéon, have found a fine tombstone, evidently belonging to some ancient cemetery, and adorned with a figure of a woman, and escutcheons with fleur-de-lys.——There is some talk of restoring the Hôtel d'Uzes, at Tonnerre, and the Société des Sciences Historiques have energetically protested against the work as calculated to completely destroy the architectural character of the building, a most artistic example of the work of the sixteenth century, and which is a constant source of interest to visitors.——The new bell of the Church of Notre Dame at Fourirère, Lyons, has just been inaugurated. It sounds F sharp, and weighs 7,550 kilogrammes.——The first stone of the new maritime laboratory at Tamaris (Var) is to be laid on the 29th of this month; it has been established by the Faculté des Sciences at Lyons.——The national exhibition which was to have been opened at Lyons in 1892 has been deferred to 1894. The town has entrusted the construction of the building to a syndicate of architects and contractors.——The works for the sanitation of Marseilles are to be commenced in October.——A statue of Clement Marot, the poet, is to be inaugurated at Cahors in October.——The Breton sculptor Caravanniez has been authorised by the Government to erect a statue of the Virgin on the rock of Bizeux, between St. Servan and Dinard (a part of the country well known to English visitors). It will be of bronze, 12 mètres high, on a pedestal of granite 4 mètres high, and will represent "La Vierge Protectrice des Marins."——A committee has been formed at Ponteharra, under the presidency of the Grand Chevalier of the Legion of Honour, to erect a monument to Bayard, the chevalier "sans peur et sans reproche."——The jury of the annual art exhibition at Munich has awarded honours to the following French artists:—MM. Emile Baraie, Jacques Blanche, and Adrien Demont, painters; M. Roty sculptor, and M. Horte, engraver.——Several members of the Society of Civil Engineers of France are in Holland on a scientific visit to the works at Amsterdam and Rotterdam.——There is an industrial and artistic exhibition open at Saumur, to close on the 20th.——M. Yves Guyot has just opened the railway from La Guerche to Château-Meillont. The new line traverses an agricultural district, and joins the Orleans railway.—— We have to record the sudden death of M. Elie Delaunay the painter, at the age of sixty-three. We shall speak more particularly on another occasion of his important artistic work.——The death is announced of M. Alexandre Reneau, member of the Société Nationale des Architectes, of which he was one of the founders and for a long time the President. He was seventy-four at the time of his death.——The sculptor Joseph Tournois has died at the age of sixty-one. He received honours in the Salons of 1868, 1869, and 1870.——A distinguished archæologist, M. René Galle, is dead, a few days since, at the age of seventy-five. He had made various important excavations in Brittany and Algeria.——We have to record also the death of M. Jean Baptiste Dehaussy, painter, who after the Revolution of 1848, lived for a long time in England, where he painted a number of portraits.——The Société Régionale des Architectes du Nord has lost one of its oldest and most esteemed members, M. Duthilleul, architect, of Lille.——The death is announced of the architect Foucault, a former pupil of the École des Beaux-Arts, and member of the Société Amicale des Architectes, who occupied himself specially with journalism. He was only forty-six at the time of his death.——Lastly, we have to notice the recent death of M. Felix Narjoux, architect of the city of Paris and the Government. M. Narjoux was a veritable specialist in all matters of construction and planning of schools, which he had studied much both at home and abroad. He was also a writer and designer of great talent. Among his principal publications may be mentioned "Les Ecoles Publiques en France et Angleterre," and "Notes d'un Architecte en Allemagne, en Suède, et en Norwège." He died at the age of fifty-seven.——It is announced that the French Government intends to

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENT.

COMPETITIONS.

Nature of Work.	By whom Advertised	Premium.	Designs to be delivered.
*Proposed Buildings—Association for Promotion of Art and Music, Glasgow	The Executive Com...	Not stated	Dec. 1
*High School for Girls, Guildford	Church School Co. Lim.	.....	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor or Engineer.	Tenders to be delivered.
Pipe Sewer, &c. Motherwell	Police Commissioners	J. M'Callum	Sept. 15
Two New Streets Navigation, Glamorgan	.....	J. Evans	do.
Laying Pipe Sewers, Hale	Altrincham R.S.A.	J. McKenzie	do.
*Road-making and Sewering Works	Tottenham Loc. Bd.	J. E. Worth	do.
*Concrete Invert and Side Walls, Stonebridge Brook	do.	do.	do.
*Roadmaking and Tar-paving Works	Lewisham Bd. of Wks.	*Official*	do.
*Broken Granite	East Ham L. B.	W. H. Savage	do.
Improvements, Main Road, Cilfynydd	Gelligaer Dist. Highway Board	W. Bevan	Sept. 16
Dwelling House, &c. Banff	Mr. Milne	G. Sutherland	do.
Parsonage House, &c. Llanyre	Rev. J. P. Morgan	W. & T. Williams	Sept. 17
*Various Works	M. R. Co.	*Official*	do.
*Paving Works	Vestry of St. Matthew, Bethnal Green	T. W. Barrett	do.
*Paving Works, S. E. Hospital	Met. Asylums Board	*Official*	do.
School Extension, Houghton-le-spring	Wesleyan Trustees	D. Balfour	do.
Eight Cottages at Ynyshir	Graig Building Club	E. Williams	do.
630 yds. of Main Sewer, &c. Keith	Police Commissioners	F. D. Robertson	do.
*Alterations, &c. 30, Finsbury-square	.....	C. R. Winter	Sept. 18
Chapel, Crossfield-street, Warrington	.....	R. Parry	do.
New Presbyterian Church, Blackstaff-rd. Belfast	The Committee	Young & Mackenzie	do.
Alterations to Stables, &c. Totnes	J. Templeton	W. M. Tollitt	Sept. 19
Sea Causeway and Swivel Bridge, Bealadangen, County Galway (2 contracts)	.....	J. Perry	do.
*Levelling and Tar-paving School Yards	Bromley Sch. Bd.	Mr. Cregeen	Sept. 21

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Broken Granite	Southampton Corp.	W. B. G. Bennett	Sept. 22
*Erection of Boarded Fencing	Borough of West Ham	Lewis Angell	do.
*Public Hall and Offices	do.	do.	do.
*Broken Granite, Steam Rolling, &c.	Edmonton Loc. Bd.	G. Eedes Eachus	do.
Mission Chapel, East Fordington	The Trustees	J. Dibben	do.
*Broken Granite and Flints	Twickenham Loc. Bd.	G. B. Laffan	Sept. 23
Villas, Rokeby Avenue, Redland	.....	A. Barratt	do.
Villas, Montrose Avenue, Redland	.....	do.	do.
Dwelling House, Dufftown	.....	R. Yeats	do.
*Additions to the Patent Office	H. M. Works	*Official*	Sept. 24
Gas Lighting	Compton Gifford L. B.	.....	Sept. 25
136 tons Cast-iron Water Pipes	Young's Paraffin Light & Mineral Oil Co. Lim. Glasgow	Johnstone & Rankine	Sept. 26
Laying 3¼ miles of Water-piping, &c.	do.	do.	do.
Formation of Cemetery	Houghton-le-Spring U.R.S.A.	D. Balfour	Sept. 28
*Making-up Road and Pipe Sewer	Barnet Local Board	W. H. Mansbridge	Sept. 30
*Erection of Pier, Blackpool	Blackpool Pier &c. Co. Lim.	F. P. Worthington	do.
*Alterations, &c. to Free Library	Cardiff Corporation	Seward & Thomas	do.
Public Library, Museum, &c.	Corporation of Carlisle	W. Howard Smith	Oct. 1
Extension of Water-supply, Minshull, Vernon	Nantwich U.R.S.A.	J. A. Davenport	Oct. 2
Laying, &c. Water-pipes	do.	do.	do.
*Soldiers' Quarters, &c. Weymouth	War Department	*Official*	No date
Bakery, Slamannan, Stirling	Co-operative Society	T. Melvin	do.
Colliery Railway	Blainscough Colliery Co.	Mr. Rowe	do.
*Erection of Hotel, Weymouth	.....	Helyer & Munt	do
*Sewerage Works, South Camp, Aldershot	War Department	*Official*	do.

PUBLIC APPOINTMENT.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Clerk of Works	Dorking U.R.S.A.	2*l.* 10*s.*	Sept. 23

Those marked with an Asterisk (*) are advertised in this Number. *Competitions, p.* iv. *Contracts, pp.* iv., vi., *and* viii. *Public Appointments, p.* xx.

construct at Rome a palace for the accommodation of the two French embassies, accredited respectively to the Quirinal and the Vatican.

BORNHOLM ISLAND.—It will be of interest to hear that some large granite quarries are to be opened on the northern extremity of the island. The extensive works taken in hand to adapt the site for the purpose are of the most modern description, machinery of latest date is to be employed, and all boring is to be done by pneumatic power. Some million "krone" will be spent on the preliminary work, and the small harbour which is being constructed in connexion with the enterprise will cost about 400,000 "krone." The stone shows a most agreeable colour, and its durability is said to be excellent. German money has been invested, a Hamburg merchant holding the shares of the so-called "limited company." The intended market is for the present to be in Germany (Baltic coast); on completion of the North Sea-Baltic Canal, also in England and the Netherlands. That the stone deserves notice may be seen by the large orders which apparently already have been made on it (Vistula Regulation, 1,000,000 marks; the North Sea-Baltic Canal Works, Hamburg Harbour Works). Unfortunately the new works spoil the finest piece of scenery on the island.

MISCELLANEOUS.

OPEN SPACES AT HORNSEY.—We are glad to hear that the Hornsey Local Board have acquired about eight acres of picturesque and well-wooded land for the extension of their pleasure gardens at Hornsey. As the property was about to be laid out for building, the Board authorised its Chairman (Mr. H. R. Williams) to negotiate with the owners with a view to its purchase, and it has been secured for the sum of 5,000*l.*, and is being enclosed with iron railings previous to being laid out as a public recreation ground. The newly-acquired property contains some fine trees. It extends from the existing pleasure gardens at Hornsey to Crouch End, and is situated in the midst of a district which is being rapidly covered with houses. The acquisition of this property, although of somewhat limited area, will be a lasting benefit to the neighbourhood, and it is to be hoped that Mr. H. R. Williams will be equally successful in the efforts he is making to obtain the grounds of the Alexandra Palace as a public park for the use and enjoyment of the people. London and its overgrown suburbs have need of every available open space that can be preserved to them.

GLASGOW ARCHITECTURAL ASSOCIATION.—The usual monthly meeting of this association was held on the 1st inst.,—the President, Mr. William J. Anderson, in the chair,—when a paper on "Modern Congregational Churches" was read by Mr. Henry D. Walton. After summarising the objections to the Anglican type as generally practised, having aisles that require columns, he directed attention to a suggestive field in Eastern Mediæval examples. At Torcello and Milan, Thessalonica and Cairo, are models that require but little adaptation to meet the necessities of a large auditory and yet conserve reasonable ecclesiastical and architectural traditions. Diagrams and prints of the old examples instanced, and of some modern London attempts to apply these to present-day requirements, were exhibited. The discussion was opened by Mr. M'Gibbon and taken part in by several. The customary vote of thanks was passed to Mr. Walton for his paper.

THE JUNIOR ENGINEERING SOCIETY.—The annual summer excursion of this society, which has recently taken place, afforded the members an opportunity for inspecting some of the most important works in the country, Middlesbrough and the district being visited. The party started from London, on Saturday, the 15th ult., for Scarborough, where they remained until Monday morning, when they proceeded to Brotton for the Lumpsey ironstone mines of Messrs. Bell Bros. They were shown the surface machinery and underground workings by Mr. A. L. Steavenson and Mr. L. W. Dixon, the methods of operation being exhaustively explained. The former gentleman gave an interesting account of the geological formation of the Cleveland district, and of his experience there in assisting, as mining engineer, the development of the various mines over a period of some years. From Brotton the party were conveyed by brakes to Saltburn, where train was taken for Middlesbrough, to visit, in the afternoon, Messrs. Bell Bros.' Clarence Ironworks. Here Mr. Cooper, on behalf of Mr. T. Hugh Bell, took the party in hand, and showed them the many features of interest in connexion with blast furnace practice. Improvements and additions in the plant are being pushed forward, and when completed will result in a considerable increase in the output of the furnaces. On Tuesday morning Messrs. Raylton Dixon's shipbuilding yards were visited, Mr. Wayman Dixon and the principals conducting the party round. The vessels in hand being in various stages of construction, from the laying of the keel to the finished steamer ready for sea, the arrangement of a progressive route through the works was greatly appreciated by the visitors, who were thus enabled to follow in every particular the various shipbuilding processes. In the afternoon the chemical works of Messrs. Bell Bros. were seen, the manager, Mr. Lucas, explaining the action of the plant employed. On the following morning, Wednesday, train was taken for the Hartlepools, where, at the old town station, the party were met by Mr. Williams, of the Central Marine Engine Works, who acted as their guide along the sea-wall and promenade, through the fish quay to the North-Eastern railway dock swing-bridges, which were set in motion and their machinery examined. Here Mr. Mudd met the party, and proceeded to show them over the Central Marine Engine Works, which are under his management. Leaving these works the visitors passed thence through Messrs. W. Gray & Co.'s shipbuilding yards. The afternoon was devoted to the West Hartlepool steel and iron works, the metal expansion works, and the Seaton Carew ironworks where hematite ore is dealt with. At the two former places Mr. M. Gray was present to receive the visitors. The Siemens-Martin steel furnaces, the gas-producers, the powerful machinery for ingot, slab, and plate rolling, the puddling-furnaces, steam-hammers, and bar rolling-mills were all viewed with the greatest interest, as was also the ingenious machine for manufacturing "expanded metals." At Seaton Carew, one of the blast-furnaces had been blown out, and the method of cleaning and preparing for re-starting was explained by the engineer of the works. Leaving there, brakes conveyed the members to the dock, where they embarked for a trip in the bay by steamer kindly placed at their disposal by the North-Eastern Railway Company. On Thursday morning the same Company's steamer *Cleveland* was specially reserved for a trip from Middlesbrough to Sunderland. Mr. Henry Wake, Engineer to the Wear Commission, and his assistants, did all in their power to render the visit to the harbour, chain and anchor testing, Roker pier, and other works, both instructive and enjoyable, explaining in the fullest possible manner their numerous points of interest. One of the Commissioners' steamers was kindly made available for a trip up the river to visit Messrs. W. Doxford & Sons' shipbuilding and engineering works. On Friday from Middlesbrough the party went to Darlington to visit the locomotive works of the North-Eastern Railway. The Darlington Forge was afterwards seen under the guidance of Mr. Putnam, some fine examples of work turned out being shown. In the afternoon, the Thornaby ironworks of Messrs. W. Whitwell were visited. Mr. Whitwell himself described the construction and working of the various appliances. The party then embarked for a trip down the river to inspect the improvements which have been carried out by the Tees Commissioners. This body favoured the Society with the loan of a steamer for the purpose, and their assistant-engineer was on board. In the evening the second summer dinner of the Society was held at the Grand Hotel, Middlesbrough, Mr. S. H. Wells, Past-chairman, in the chair. On the Saturday the party left for Durham, visiting first the Grange ironworks, where they were shown round by the manager, Mr. Lawrence, and, subsequently, the Cathedral and Castle, by facilities granted by the courtesy of the Dean and the Durham Architectural Society.

THE CRYSTAL PALACE ELECTRICAL EXHIBITION, 1892.—The Special Committee appointed by the Electrical Section of the London Chamber of Commerce to co-operate with the directors of the Crystal Palace Company in promoting the success of the Exhibition, consists of the following gentlemen: Mr. R. E. Crompton, M.Inst. C.E. (Chairman), Major S. Flood Page and Mr. Emile Garcke (Vice-Chairmen), Mr. J. E. H. Gordon, B.A., M.Inst. C.E., Mr. G. Binswanger, and Mr. Alexander Siemens, M.Inst. C.E.

A NEW STONE DEPÔT AT KENSINGTON.—Messrs. Gething & Grice, stone merchants, of John-street, Bedford-row, inform us that they have, for the greater convenience of their customers, taken a railway wharf and offices at Nos. 191 and 201, Warwick-road, Kensington (Great Western Railway Depôt). They will open the wharf on September 21.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

15,331.—SMOKE-CONSUMING APPARATUS: *P. Gentil and A. E. Vanoni.*—In factory chimneys and in large furnaces the smoke is (according to this patent) cooled and condensed by water, injected so that it will increase the draught and draw off the products of combustion into a conduit or sewer.

16,019.—WATER-TAPS: *J. D. Brookes.*—In "bib" and "stop" taps a loose indiarubber ball is, according to this patent, placed within the body or lower part of the tap, forming the inlet connexion. The valve spindle is elongated or extended below the valve to act upon the ball below or hold the same down, so as not to interfere with the passage of the water. When the valve is removed for repairs, the ball being free rises by the action of the water, and effectually stops the passage.

6,018.—ROOM VENTILATOR: *C. Henshaw.*—The ventilators which are the subject of this patent are made with an ordinary grid or slide for regulating the inlet and controlling the outlet of air; but there is also a chamber for collecting the air, provided with fans for drawing it in or forcing it out.

10,046.—WATER WASTE PREVENTER: *T. Crump and others.*—A valve worked by a ball lever supplies the cistern for flushing the closet, and a second valve controls the inlet, so that no water passes through the valve while the cistern is being discharged.

10,472.—SYPHON CISTERN, &c.: *T. Salter.*—In order to provide an after-flush, a secondary chamber with a secondary syphon pipe is used. The pipe has a circular bend in a vertical direction to afford a water seal when the cistern is at rest.

10,473.—WASH-OUT CLOSETS: *T. Salter.*—The closet which is the subject of this patent is designed to be used with the syphon cistern before described. It is simply and easily constructed. The basin has a spigoted outlet fitting into a cup forming a spigot-and-socket joint, and bends are provided with slotted flanges to allow them to be fixed one within the other at any required angle.

10,959.—LAVATORY BASINS: *W. Drayson.*—The basin, flushing-rim, and slab are made all in one piece, effecting considerable economy in the manufacture, and avoiding the inconvenience of several pieces, and the trouble of putting them together when fixing.

15,617.—WINDOW FASTENER: *A. E. Rose.*—This consists of a hinged or pivotted stop provided with means for attachment to the sill of the upper sash of the window. The stop or catch is made of triangular pattern, the fastening device being exceedingly simple.

15,811.—FASTENERS FOR CASEMENT WINDOWS: *H. Hardy.*—The stay rod is provided with a ball working in a socket-joint, through which slides a guide with a projecting tongue or rib notched to fit in other notches formed in the stay bar. The fastener is a lever pivotted to a plate, the lever having on it a notch for engaging the window-frame or casement. A spring normally holds the lever in its locking position whilst allowing it to spring back sufficiently to allow the opening and closing of the window.

15,911.—TUNNELLING: *F. M. Wolff.*—According to this invention, shafts are sunk by removing an annular part around the boundary of the proposed shaft by first drilling a series of equidistant holes, and subsequently enlarging these (so as to overlap) by a series of chisel-pointed drills, geared to rotate and uniformly clear each other. The core is removed by blasting or other usual means.

15,939.—FLUSH AND BARREL BOLTS: *E. V. Orford.*—The flush bolt, which is the subject of this patent, is made from sheet-metal, with grooves or channels crosswise for receiving or carrying the bolt, with arm or lever for actuating and securing. A barrel bolt is made in the same way, but with the stop-piece set either to the right or left as required, all struck from the sheet-metal.

10,240.—VENTILATING DRAINS: *J. Jones.*—This invention consists of an elaborate arrangement for connecting ventilating pipes with the drains and the use of a self-sealing cover, in shape similar to that patented previously by the same applicant. The usual arrangements for inspection and trapping or sealing are made.

NEW APPLICATIONS FOR PATENTS.

August 17.—13,822, J. Hughes, Paint Burner.—13,824, H. Champness, Construction and mode of fastening when shut, Sliding or other Doors.—13,825, T. Bickle, Metal Screws.—13,846, W. Slons, Printing by Lithography Wall-papers, &c.—13,852, W. Brett, Sashes for Windows, &c. — 13,857, H. Albee, Wood-working Machines.

August 18.—13,895, J. Breeden, Flushing Apparatus for Water-closets.—13,899, S. Eddington, Machinery for Moulding Bricks, &c.—13,914, T. Whitaker, Flooring or Roadway of Bridges, &c.—13,951, T. Harbottle, Tunnelling Apparatus.—13,957.—J. Davis, Flush Hinges.

August 19.—13,968, R. Fletcher, Sanitary Flushing.—13,983, W. Winter, Moulds used in the Manufacture of Artificial Stone, &c.—14,043, W. Hoon, Screw Driver.

August 20.—14,050, A. Parker and others, Combination Bolt and Indicator for Doors.—14,059, J. Barry and P. Rice, Stoves.—14,064, L. Wilson, Blocks and Tiles for Paving, Flooring, Facing Walls, Ceilings, &c.—14,076, J. Sherwin, Encaustic Method or Process of Decorating Tiles, &c.—14,116, W. Copping, Window Fastening.

August 21.—14,139, T. and A. Benson, Water-closets.

August 22.—14,182, A. Fowler, junr., Automatic Tank Water Closet.—14,184, J Shaw, Fire Places.—14,188, J. Hall, Wood-cutting Machines.—14,190, D. Knowles, Window-sash Fasteners.—14,202, H. Carter, Syphon Cistern.—14,210, M. Tomkins, Preventing Draught from Passing between Window-sashes and Frames.—14,235, L. Linden, Heating Greenhouses and other buildings with water.

August 24.—14,253, A. Deacon, Tools for making Hinges.

August 25.—14,302, S. Smith, Sash-fasteners.—14,348, E. Ripp, Ladders.—14,375, H. Lake, Door Checks and Closers.—14,394, J. Russell, Treatment of Sewer-gas.

August 26.—14,406, R. Waugh, Spring Bolt.—14,412, J. Liddle, Automatically Closing, Rising, Pivot, or Centre Hinge.

August 27.—14,464, H. Emery, Connecting Rain-water Pipes to the Walls of Dwelling-houses, &c.—14,466, H. Ellery, Revolving Chimney and Ventilator Cowls and Tops.—14,471, E. Lee, Brick-cutting Table.—14,476, J. Trimming, Instrument for the Use of Architects and Surveyors.—14,506, C. Jensen, Syphon Water-closets.

August 28.—14,539, G. Phillott, Ventilators and Chimney-cowls.—14,552, A. Boult, Hinges.—14,560, R. Adams, Springs for Doors, &c., and Adjustments and Checks for preventing Slamming.—14,576, J. Jeffreys, Glazing Bars.

August 29.—14,591, J. Graham, Clamp for Mitre Work.—14,594, J. Bradbury, Circular-saw Bench.—14,603, J. Wild, Band-sawing machines.—14,642, J. Cabuy, Drain Traps.—14,655, Saw-setting Device.

PROVISIONAL SPECIFICATIONS ACCEPTED.

9,440, W. Horn, Metallic Lathing for Walls of Buildings.—10,637, R. and R. Brown, Water-closets.—12,102, F. Treacher and T. Linskill, Automatically Closing Doors.—12,429, F. Reynolds and J. Brown, Building Cements.—12,583, W. Baker and Others, Ventilating-gear for Greenhouses and like purposes.—12,762, W. Morton, Ornamental Panels or Decorating Material for Walls, &c.—13,016, G. Williams, Manufacturing Hydraulic Cement.—13,037, S. Jennings and J. Morley, Water-closets.—13,452, S. Delepine and A. Gomess, Removal of Smoke from Chimneys and for Disinfecting Sewers.—13,534, W. Gibbons, Door-chains.—12,633, T. Harries, Artificial Stone.—12,651, W. Reynor, Preventing Waste of Water in Flushing Water-closets, &c.—12,748, L. Covilbund, Draught Excluder, for Doors and Windows.—12,760, J. Pullan and Others, Brick Pressing Materials.—13,010, J. Carr, Form of Tiles for Covering Roofs, &c., and methods of fixing same.—13,957, J. Davis, Flush Hinges.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

16,305, A. Ross, Water-syphon Cisterns, &c.—16,394, F. Ham and R. Preston, Syphon Cisterns.—16,801, P. Hollick, Corded Cement Sack.—8,589, J. Richardson, Hinges,—10,077, W. Rundell, Screws, and Tools for inserting same.—10,615, R. Röhr, Stone-dressing Machines.—12,387, C. Griffiths, Ventilators.—15,901, J. Sears, Ventilators.—17,315, A. Lamplough, Window Fastenings.—11,906, J. Cohen, Window Sashes.—12,810, H. Newton, Augurs and similar Tools.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

AUGUST 31.—By *Ventom, Bull, & Cooper*: The lease and goodwill of 1 and 3, Silver-st., Oxford-st., u.t. 21 yrs., 260*l.*

SEPTEMBER 1.—By *Eastman Bros.*: 1, South-ter., Bexley-heath, f., r. 20*l.*, 195*l.*

SEPTEMBER 2.—By *A. J. Sutherland*: 4, Ponsonby-pl., Westminster, u.t. 34 yrs., g.r. 6*l.*, r. 48*l.*, 395*l.*

SEPTEMBER 3.—By *Izard & Izard*: 14, Charlton-st., Fitzroy-sq., u.t. 22 yrs., g.r. 24*l.*, r. 65*l.*, 320*l.*—By *Newbon & Co.*: 40, Compton-rd., Canonbury, u.t. 53 yrs., g.r. 8*l.* 8s., r. 45*l.*, 355*l.*; 72, Woodstock-rd., Finsbury Pk., u.t. 76 yrs., g.r. 6*l.* 10s., 315*l.*; f.g.r. of 42*l.* 8s., with reversion in 25 yrs., St. John's Wood, 1,925*l.*

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; l.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G.	ton	8/0/0 9/0/0
Teak, E.I..	load	8/0/0 14/0/0
Sequoia, U.S.ft.cu.		2/3 3/0
Ash, Canada	load	2/5/0 4/0/0
Birch, do.		2/5/0 4/5/0
Elm, do.		3/5/0 4/15/0
Fir, Dantsic, &c.		2/0/0 3/10/0
Oak, do.		2/10/0 4/10/0
Canada		4/17/6 6/10/0
Pine, Canada red		2/10/0 3/10/0
Do, yellow		2/0/0 5/0/0
Lath, D'ntsic, fath		5/0/0 6/0/0
St. Petersburg		5/0/0 7/0/0
Deals, Finland, 2nd & 1st std	100	8/0/0 10/0/0
Do, 4th & 3rd		7/10/0 8/10/0
Do. Riga		6/10/0 8/0/0
St. Petersburg, 1st yellow		10/0/0 14/0/0
Do. 2nd yellow		8/10/0 9/10/0
Do. white		7/0/0 10/0/0
Swedish		7/0/0 15/10/0
White Sea		8/10/0 17/0/0
Canada, Pine 1st		13/0/0 25/0/0
Do. do. 2nd		9/0/0 16/0/0
Do. do. 3rd, &c.		6/10/0 10/0/0
Do. Spruce. 1st		8/0/0 10/10/0
Do. do. 3rd & 2nd		6/0/0 7/15/0
New Brunswick		5/10/0 7/10/0
Battens, all kinds		3/10/0 15/10/0
Flooring Boards, sq., 1 in. prep. 1st		0/8/0 0/14/0
Do. 2nd		0/7/6 0/11/0
Other qualities		0/3/0 0/8/0
Cedar, Cuba	ft.	/4 /4½
Honduras, &c.		/4 /4½
Mahogany, Cuba.		/4½ /0
St. Domingo, cargo av		/4¾ /6¾
Mexican do. do		/4¾ /5
Tobasco do. do		/5⅜ /7
Honduras do..		/5¾ /6¾
Box, Turkey	ton	4/0/0 13/0/0
Rose, Rio		10/0/0 20/0/0
Bahia		9/0/0 18/0/0
Satin, St. Domingo	ft.	0/0/9 0/1/3

TIMBER (*continued*).		
Satin, Porto Rico	0/0/10	0/1/6
Walnut, Italian..	0/0/3½	0/0/7
METALS.		
IRON—Pig, in Scotland	ton	47/0/0 47/1/0
Bar, Welsh, in London		5/10/0 5/12/6
Do. do. at works in Wales		5/10/0 5/12/6
Do. Staffordshire, in London		6/10/0 6/15/0
COPPER—British, cake and ingot		54/10/0 56/0/0
Best selected		56/0/0 57/10/0
Sheets, strong		65/0/0 66/0/0
Chili, bars		52/2/6 52/10/0
YELLOW METAL	lb.	0/0/5⅝ 0/0/6⅛
LEAD—Pig, Spanish	ton	12/2/6 12/6/3
English, com. brands		12/7/6 12/10/0
Sheet, English, 3 lbs. per sq. ft. and upwards		14/0/0 0/0/0
Pipe		14/10/0 0/0/0
ZINC—English sheet	ton	27/0/0 0/0/0
Vieille Montagne		27/10/0 0/0/0
TIN—Straits		91/7/6 91/17/6
Australian		91/7/6 91/17/6
English Ingots		94/5/0 95/0/0
OILS.		
Linseed	ton	20/0/0 20/5/0
Cocoanut, Cochin		30/0/0 31/0/0
Do. Ceylon		26/0/0 0/0/0
Palm, Lagos		25/10/0 0/0/0
Rapeseed, English pale		31/10/0 0/0/0
Do. brown		30/0/0 0/0/0
Cottonseed ref...		20/0/0 0/0/0
Oleine		0/0/0 0/0/0
Lubricating, U.S.		4/10/0 5/10/0
Do. refined		6/0/0 11/0/0
TAR—Stockholm	barrel	0/19/0 0/0/0
Archangel		0/12/0 0/12/6

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays.*]

ACTON.—For constructing first portion of new road and sewer at Acton, for Mr. E. J. Edwards. Mr. Charles R. Maddox, surveyor, Warwick-court, Gray's Inn:—

M. W. Rowles	£979	0	0
Nowell & Robson	669	0	0
Serff Bros. & Co.	665	0	0
D. Cronin	623	13	6
A. T. Catley	£620	0	0
Warner & Co.	588	0	0
E. Parry	580	0	0
Tomes & Wimpey*	580	0	0

* Accepted.

BARRY (Glamorganshire).—For the erection of a hotel in Charles-street and Salisbury-road, for the Park (Barry Docks) Building Company (Limited). Mr. W. H. Dashwood Caple, architect, 1, St. John's-square, Cardiff. Quantities by the architect:—

Jenkins & Arnold	£2,674	Chas. Shepherd & Son, Ltd., Croft-st., Cardiff*	£2,475
Stephens, Bastow, & Co.	2,597		

* Accepted.

BRANDON.—For the erection of seven houses and a four-stalled stable, with outbuildings, &c., at John-street, Meadowfield, Brandon. Mr. James Linday, architect, 9, Cockton Hill-terrace, Bishop Auckland:—

J. D. Carr	£2,700	0	
T. Manners	2,458	0	
W. Granger	2,365	5	
J. White	2,240	0	
W. Lax	£2,030	0	
J. Sanderson, Stockton (accepted)	1,850	0	

BRISTOL.—For the erection of a warehouse, Temple Back, Bristol, for Messrs. F. Clarke & Son. Mr. W. B. Gingell, architect:—

Serle	£3,453	Beachem & Balment	£2,965
Wilkins	3,400	Perkins	2,898
Walters	3,295	Cowlin & Son	2,894
Neale	3,253	Veals	2,894
Hatherly	3,204	Stephens, Bastow, & Co.	2,849
Brock	3,050	Love	2,775
Easterbrook	2,998		

CARDIFF.—For the erection of a new church in Tyndall-street, Cardiff, exclusive of foundations, and boys' and priests' sacristies, for the Rev. F. Butler. Mr. C. C. Jones, architect, 2, Charles-street, Cardiff. Quantities by Mr. Robey Carpenter:—

Turner & Sons, Cardiff £2,038 0 0

CHADWELL-HEATH.—For building two villa-residences at Chadwell-heath, for Mr. Chandlers. Messrs. Wigg, Oliver, & Hudson, architects, 80, Leman-street, Whitechapel:—

Hammond	£768	Calven	£700
Holiday	755	Death	660
Gregor	737	G. Barker	642

CHARD.—For the erection of a police-station, with constable's dwelling-house attached, at Chard. Mr. C. E. Norman, County Surveyor, Hammet-street, Taunton:—

H. J. Spiller	£930	A. Poole	£845
W. Harrison	881	Fowler & Stickland	776
G. H. Pollard	855	F. Hill, Chard (accepted)	720

CROYDON.—For bar-fittings, pewtering, &c., at the "Railway Bell" public-house, West Croydon. Mr. F. West, architect:—

W. L. Simpson, Camberwell £600 0 0

HEREFORDSHIRE.—Accepted for alterations, repairs, and improvements to stables at Sarnesfield Court, for Mr. G. W. Marshall. Mr. H. Hardwicke Langston, architect, 9, Great James-street, Bedford-row, London:—

H. Millward £530 0 0

HEREFORDSHIRE.—Accepted for laying on water-supply to mansion, Sarnesfield Court, by gravitation,—reservoir and about 2,100 yards of 2-in. cast-iron main, &c., for Mr. G. W. Marshall. Mr. H. Hardwicke Langston, architect, 9, Great James-street, Bedford-row, London:—

Beck & Co., Limited £631 17 9

LINCOLN.—For alterations and additions to the Church House, Lincoln, for the Committee. Mr. W. Watkins, architect, Lincoln:—

W. Wright & Sons	£1,390	M. Otter & Co.*	£1,267
H. S. & W. Close	1,294		

* Accepted.

[All of Lincoln.]

LONDON.—For additions and alterations to the "Eagle" public-house, Tottenham, N., for Mr. T. F. Barlow. Mr. John E. Pinder, architect, Bridge House, South Tottenham, N.:—

Yardley & Sons	£533	H. Knight & Son	£495
F. Voller	520	J. Groves	373

LONDON.—For new ball-room and sundry alterations at No. 12, Great Prescott-street, E., for Mr. H. Friedlander. Messrs. Wigg, Oliver, & Hudson, architects, 80, Leman-street, E.:—

Holiday	£1,217	Calnan	£809
G. Barker	946	Scotney	765

LONDON.—For alterations to the "Coach and Horses," 4, Dover-street, Piccadilly, for Mr. G. Marshall. Mr. W. Seckham Witherington, architect, 79, Mark-lane, E.C.:—

Drew & Cadman	£1,597	W. G. Larke & Son	£1,530
D. Laing & Son	1,595	C. F. Kearley	1,498

LONDON.—For pulling-down and rebuilding No. 462, Hackney-road. Mr. F. J. Smith, architect:—

McSwiney	£382 0	Hood	£373 0
Thomerson & Son	377 10	Ivory	348 10

LONDON.—For alterations to the "Red Lion," Eldon-street, Finsbury. Mr. D. Henry North, architect, 63, Basinghall-street, E.C.:—

A. & W. Garnar (accepted) £285 0 0

LONDON.—For making-up and sewering Forest-road, Enfield Highway, N., for the Silvertown, Canning-town, and Victoria Dock Land Company. Mr. J. O. Cook, architect, 1, Eleanor-road, Woolwich:—

G. Jackson	£509	G. Bell	£469
J. Jackson	500	W. H. Wheeler, London*	438
W. Nichols	495		

* Accepted.

LONDON.—For pulling-down and rebuilding premises at Chelsea, for Mr. W. Cosby Broom. Mr. William Hunt, architect, 5, York-buildings, Adelphi, W.C.:—

William Downs	£1,080	Sydney Knight	£890
Turtle & Appleton	1,048	Eyears	847
Charles Wall	1,045	H. Somerford & Sons	799
B. E. Nightingale	948	E. P. Bulled & Co. (accepted)	779

Machinery.

Summerscales & Sons (accepted) £583 12 0

LONDON.—For the completion of warehouse premises, Nos. 35 and 37, Hoxton-street, N. Mr. Fred. G. Grierson, architect, 9, Old Jewry-chambers, Cheapside, E.C.:—

Fredk. Voller	£520	J. Pocock	£433
H. & E. Lea	495	C. Watts*	398
Courtney & Fairbairn	473		

* Accepted.

LONDON.—For pointing and repairs to the east wing of the Newington Workhouse, for the Guardians of St. Saviour's Union:—

J. Watson & Co.	£575	J. C. Howard	£277
Hussey	485	Williams & Richards	260
Brightmore	367	George Newton	257
Foster & Sons	330	R. Edwards	246
J. Richards	300	R. Seed	220
F. C. Stokes & Co.	287		

LONDON.—For addition and alteration to warehouses of the London Flour and Grain Company, Nicholay-road, N. Mr. George Carter, architect, 513, Holloway-road:—

Smith	£185	Long	£160
Smith	175	Kirby & Chase	148

LONDON.—For the extension of nurses' quarters, and escape bridges, at the Infirmary, Brook-street, S.E., and officers' lavatories and extension of workshops at the workhouse, Princes-road, for the Lambeth Guardians. Mr. Thos. W. Aldwinckle, architect, 2, East India-avenue, Leadenhall-street, E.C. Quantities supplied:—

		Less if Workshop Roof is Raised Bodily.
G. Gibson	£4,687	£10
B. E. Nightingale	4,586	—
W. Smith	3,997	50
G. E. Todd	3,997	30
J. Holland	3,959	10
W. Johnson & Co., Limited	3,917	25
A. M. Deacon & Co. (accepted)	3,829	20

LONDON.—For alterations and additions to the workshops at the workhouse, Marlees-road, W., for the Guardians of St. Mary Abbotts, Kensington. Mr. Thos. W. Aldwinckle, architect, 2, East India-avenue, Leadenhall-street, E.C.:—

Williams & Richards	£978	W. Johnson & Co., Ltd.*	£875
Flew & Co.	949		

* Accepted.

LONDON.—For pulling down and rebuilding the "Hope" Beer-house, for the New London Brewery Company. Mr. W. M. Brutton, architect, 1, Catherine-street, Strand:—

Archer	£915	Romaine & Co.	£850
Scutt	900	Edwards & Medway*	835

* Accepted.

LONDON.—For bar fittings at the "Man in the Moon," King's road, Chelsea, for Mr. Young:—

Edwards & Medway £1,110 0 0

[No competition.]

MANNAMEAD (Devon).—For the construction of a sewer at Mannamead. Mr. J. C. Inglis, surveyor, 1, Buckland-street, Plymouth :—

W. T. Jinkin	£155	T. Shaddock, Mutley*	£149

* Accepted.

NEWCASTLE.—For alterations and additions to St. Andrew's Tannery, Newcastle-on-Tyne, for Mr. J. G. Fenwick, J.P. Messrs Plummer & Burrell, architects, Newcastle-on-Tyne :—

S. B. Burton, Newcastle (accepted) £384 5 0

SALFORD.—For furnishing the new Ladywell Sanatorium, for the County Borough of Salford. Messrs. Maxwell & Tuke and E. & F. Hewitt, joint architects, Manchester :—

	Contract A.	Contract B.
Richard Tottie	£3,100	£1,630
A. Ashworth	2,749	1,284
Foster & Cooper	2,524	—
Goodall & Co.	2,300	1,240
Waring & Co.	2,237	1,243
John Heywood	2,084	1,276
Pearson & Brown	1,950	1,272
Kendal, Milne, & Co.	1,808	*1,098
Neill & Sons	*1,650	—
Pratt & Sons, Bradford	1,536	1,116

* Accepted.

SEVENOAKS.—For the erection of a residence in Hitchenhatch-lane, Sevenoaks, Kent, for Miss Fulton. Mr. R. H. Hill, architect, 3, Lombard-court, Lombard-street, London, E.C.:—

Rider	£2,055	R. Durtnall	£1,963
Mansfield	2,038	Wiltshire	1,927
Holloway	1,980	Leslie & Co.	1,918
G. E. Wallis	1,977	G. J. Jones, Tonbridge*	1,712

*Accepted.

SHREWSBURY.—For metalling, kerbing, channelling, paving, &c., Belle Vue-gardens, for the Improvement Committee. Mr. W. Chapple Eddowes, Borough Surveyor, Shrewsbury :—

John Brown, Shrewsbury (accepted) £159 2 10

STAFFORD.—Accepted for laying about 313 yards of cast-iron water mains, &c., for the Corporation of Stafford. Mr. W. Blackshaw, Borough surveyor, Stafford :—

C. J. Nevitt, Stafford £315 7 8

STAFFORD.—Accepted for excavating, forming, sewering, paving, &c., Pilgrim-street and Pilgrim-place, for the Corporation of Stafford. Mr. W. Blackshaw, Borough Surveyor, Stafford :—

H. Newton, Stafford £123 17 2

SUTTON.—For the erection of a residence, for Mr. W. P. Hards, at Sutton. Mr. George Carter, architect, 513, Holloway-road :—

Parry	£1,230	Smith	£1,164
Stewert	1,190	Anderson	1,149
Johnson	1,187	Stapleton	1,020

TONBRIDGE.—For building new stables, coach-house, and tool-sheds, at Tonbridge Vicarage, for the Rev. T. Howard Gill, M.A. Mr. J. F. Wadmore, architect, 35, Great St. Helens, E.C.:—

Gallard	£364	G. J. Jones, Tonbridge*	£294
Punnett	338		

* Accepted.

WOLVERHAMPTON.—For the erection of villa-residence, Copthorne-road, for Mr. H. R. Barnett. Mr. Joseph Lavender, architect, Wolverhampton :—

B. Guest	£579 0	J. Jones	£567 10
B. Rollings	575 0	G. Cave (accepted)	517 0

[All of Wolverhampton.]

WOLVERHAMPTON.—For the erection of a pair of villa-residences, Pennfields, for the Misses Riley and Mr. W. Arlett. Mr. Joseph Lavender, architect, Wolverhampton :—

G. Cave	£1,469 0	H. Gough	£1,415 12
B. Guest	1,466 0	Morell Bros., Bilston*	1,234 0
Bradney & Co.	1,446 0		

* Accepted.

SUBSCRIBERS in LONDON and the SUBURBS, by prepaying at the Publishing Office, 19s. per annum (or 4s. 9d. per quarter), can ensure receiving "The Builder" by *Friday Morning's post.*

TO CORRESPONDENTS.

J. G. (thanks).—E. J. M.—J. K. F.—G. S. (too late for consideration this week).—J. R. (too late).—K. Bros. (too late).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TERMS OF SUBSCRIPTION.

"THE BUILDER" is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum PREPAID. To all parts of Europe, America, Australia, and New Zealand, 26s. per annum. To India, China, Ceylon, &c. 30s. per annum. Remittances payable to DOUGLAS FOURDRINIER, Publisher, No. 46, Catherine-street W.C.

PUBLISHER'S NOTICES.

Registered Telegraphic Address, 'THE BUILDER,' LONDON.

CHARGES FOR ADVERTISEMENTS.

SITUATIONS VACANT, PARTNERSHIPS, APPRENTICESHIPS, TRADE, AND GENERAL ADVERTISEMENTS.

Six lines (about fifty words) or under ..... 4s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

Terms for Series of Trade Advertisements, also for Special Advertisements on front page, Competitions, Contracts, Sales by Auction &c. may be obtained on application to the Publisher.

SITUATIONS WANTED.

FOUR Lines (about thirty words) or under ..... 2s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

PREPAYMENT IS ABSOLUTELY NECESSARY.

*** Stamps *must not* be sent, but all small sums should be remitted by Cash in Registered Letter or by Money Order, payable at the Post-office. Covent-garden, W.C. to

DOUGLAS FOURDRINIER, Publisher,
Addressed to No. 46, Catherine-street, W.C.

Advertisements for the current week's issue must reach the Office before THREE o'clock p.m. on THURSDAY, but those intended for the front Page should be in by TWELVE noon on WEDNESDAY.

SPECIAL.—ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY mornings.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS Advertising in "The Builder" may have *Replies addressed to the Office, 46, Catherine-street, Covent Garden, W.C. free of charge.* Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

Now ready.
READING CASES. { NINEPENCE EACH. / By Post (carefully packed), 1s.

W. H. Lascelles & Co.

121, BUNHILL ROW, LONDON, E.C.

Telephone No. 270.

HIGH-CLASS JOINERY.

LASCELLES' CONCRETE,

Architects' Designs are carried out with the greatest care.

CONSERVATORIES
GREENHOUSES,
WOODEN BUILDINGS,

Bank, Office, & Shop Fittings

CHURCH BENCHES & PULPITS

ESTIMATES GIVEN ON APPLICATION.

MICHELMORE & REAP,

Manufacturers of

COLLINGE'S PATENT HINGES,
LEVER, SCREW, & BARREL BOLTS,
Self-Acting "FALL DOWN" GATE STOPS,
and IMPROVED GATE FITTINGS of every description.
36A, BOROUGH ROAD,
PRICES REDUCED. LIST SENT ON APPLICATION. LONDON, S.E.

The Builder Cathedral Series.

A SERIES of Illustrations of all the English and Welsh Cathedrals is now being published in "The Builder," and will be continued, in the first issue of every month, until completed.

The Illustrations in each case include an exterior view, reproduced from a drawing specially prepared for the purpose; and a ground plan, to a large scale, shaded to indicate the date and style of the several parts.

There is also a short descriptive article, having reference to the Church and its surroundings, with sketches of some of the details, &c.

No trouble or expense is being spared to make this series in every sense *artistic and trustworthy*, and as such it is confidently offered to all lovers of Ecclesiastical Architecture.

		[1891.]		
I.	*CANTERBURY,	Drawn by	*The Editor*	Jan. 3.
II.	LICHFIELD	,,	*W. H Bidlake*	Feb. 7.
III.	ST. ALBAN'S	,,	*H. W. Brewer*	Mar. 7.
IV.	PETERBOROUGH	,,	*A. Mitchell*	April 4.
V.	WELLS	,,	*R. W. Paul*	May 2.
VI.	EXETER	,,	*A. N. Wilson*	June 6.
VII.	SALISBURY	,,	*The Editor*	July 4.
VIII.	BRISTOL	,,	*R. W. Paul*	Aug. 1.
IX.	NORWICH	,,	*S. K. Greenslade*	Sept. 5.
X.	ROCHESTER	,,	*H. W. Brewer*	Oct. 3.
XI.	LINCOLN	,,	*John Begg*	Nov. 7.
XII.	GLOUCESTER	,,	*C. E. Mallows*	Dec. 5.

[Further arrangements will be duly announced.]

* This number is *out of print*, but to prevent disappointment to those desirous of possessing the series complete, the VIEW, PLAN, AND DESCRIPTION have been re-printed, and they can now be had, price ONE SHILLING; by post, 1s. 2d.

Portfolios *for preserving (unfolded)* "The Builder" Illustrations.

HALF-A-CROWN, by post 3s.

Office—46, Catherine-street, Covent-garden, W.C.

FLUATE,

FOR HARDENING AND PRESERVING STONE.

Apply to The BATH STONE FIRMS (LD.), Bath.

DOULTING FREESTONE.

THE CHELYNCH STONE. The stone from these quarries is known as the "Weather Beds," and is of a very crystalline nature, and undoubtedly one of the most durable stones in England.

THE BRAMBLEDITCH STONE. Is of the same crystalline nature as the Chelynch Stone, but finer in texture, and more suitable for fine moulded work.

Prices, and every information given, on application to CHARLES TRASK & SONS, Doulting, Shepton Mallet.

London Agent—Mr. E. A. WILLIAMS, 16, Craven-street, Strand, W.C. [ADVT.

HAM HILL STONE.

The attention of Architects is specially invited to the durability and beautiful COLOUR of this material. Quarries well opened. Quick despatch guaranteed. Stonework delivered and fixed complete. Samples and estimates free. Address, The Ham Hill Stone Co., Norton, Stoke under-Ham, Somerset. London Agent: Mr. E. A. Williams, 16, Craven-st., Strand, W.C. [ADVT.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds, and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co. [ADVT.

SPRAGUE & CO.,

PHOTOLITHOGRAPHERS,

4 & 5, East Harding-street,

Fetter-Lane, E.C. [ADVT.

TWELVE GOLD AND SILVER MEDALS AWARDED.

ZINC AND COPPER ROOFING.

F. BRABY & CO.

LONDON. ✦✦ LIVERPOOL. ✦✦ GLASGOW.

352 to 362, Euston-road. 6 and 8, Hatton Garden. 47 and 49, St. Enoch-square.

VIEILLE MONTAGNE SOLE MANUFACTURING AGENTS.

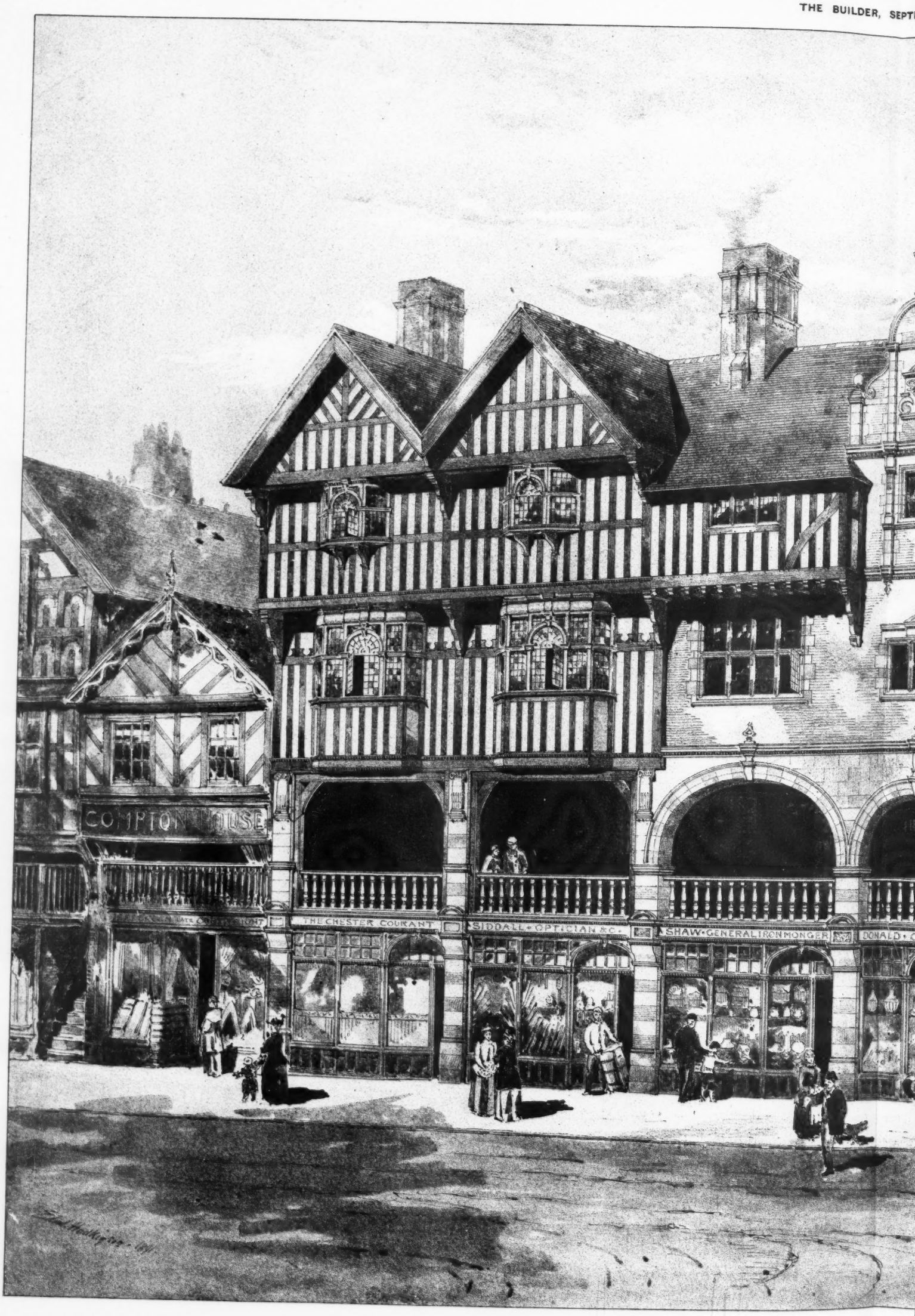
NO SOLDER. NO EXTERNAL FASTENINGS.

Particulars on Application. Chief Offices:—Fitzroy Works, EUSTON ROAD, LONDON, N.W.

INK-PHOTO. SPRAGUE & Co 4 & 5 EAST HARDING STREET, FETTER LANE, E C

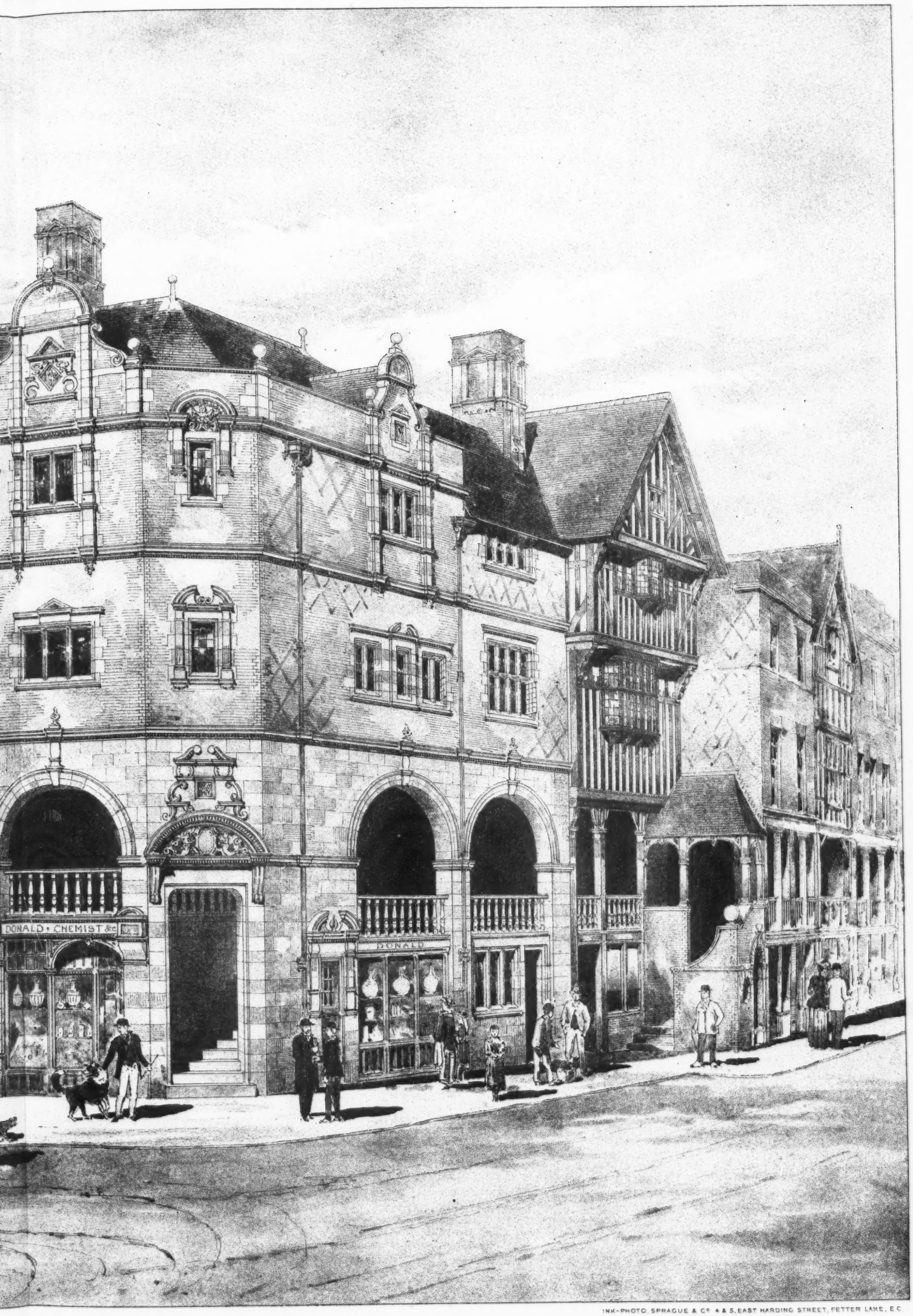
"À LA TERRE."—M. A. BOUCHER, SCULPTOR.

Médaille d'honneur, Paris Salon, 1891.



Royal Academy Exhibition, 1891.

NEW PREMISES, CHESTER.—Mr. T. M. L



INK-PHOTO. SPRAGUE & Co 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

MR. T. M. LOCKWOOD, F.R.I.B.A., ARCHITECT.

NEW HOUSE
PALACE COURT
for P Ness Esqr

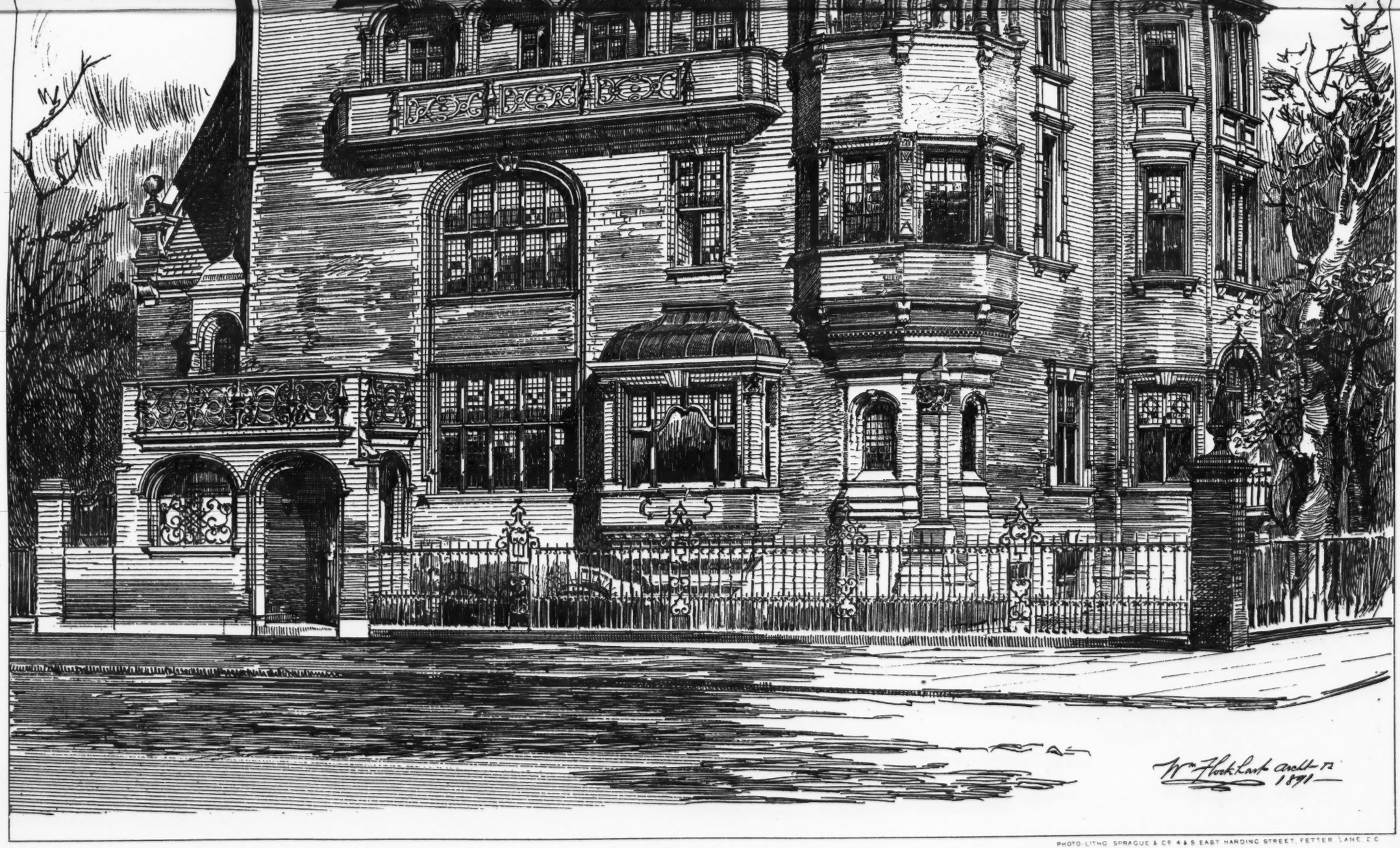
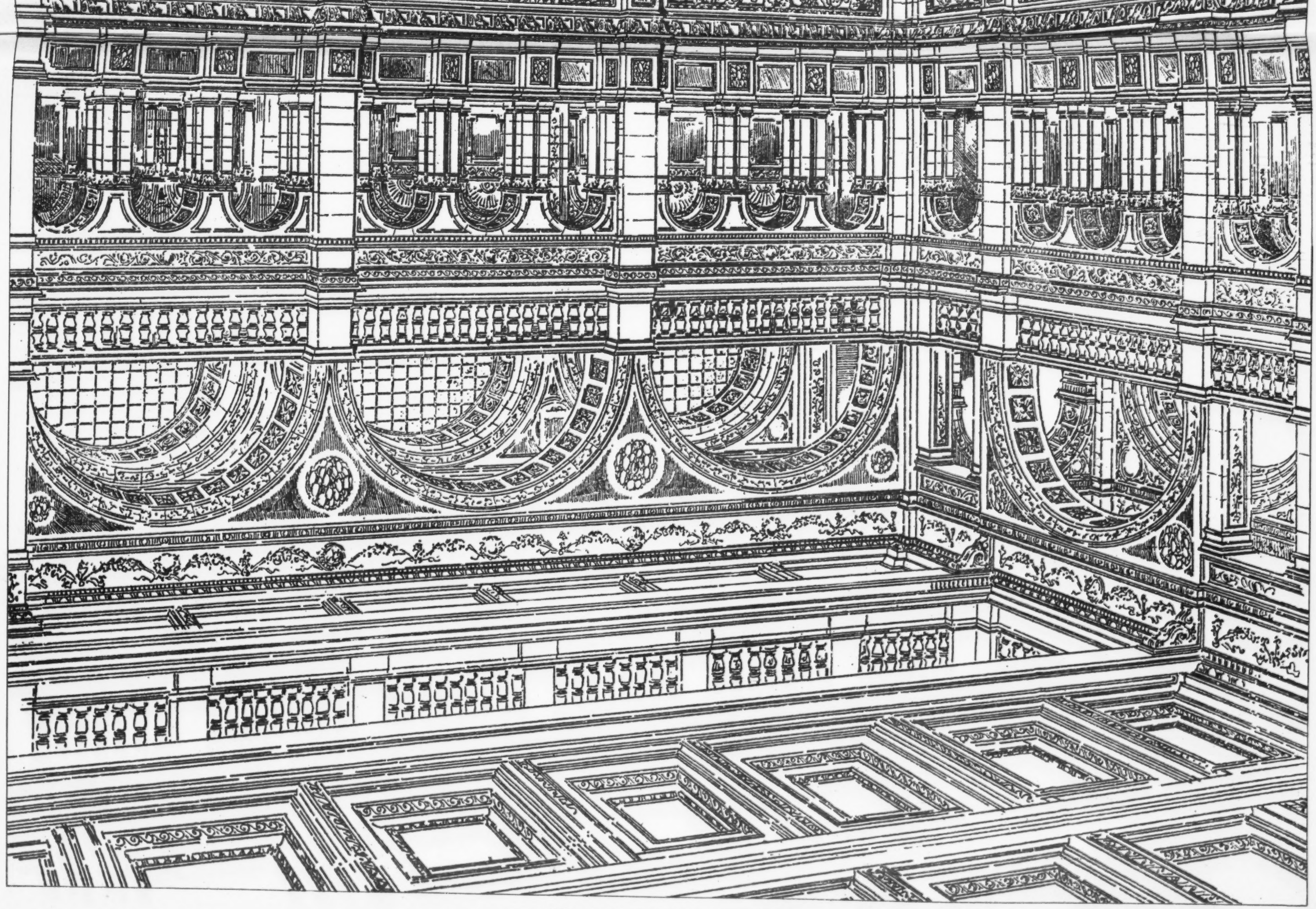


PHOTO-LITHO. SPRAGUE & Co. 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

Royal Academy Exhibition, 1891.



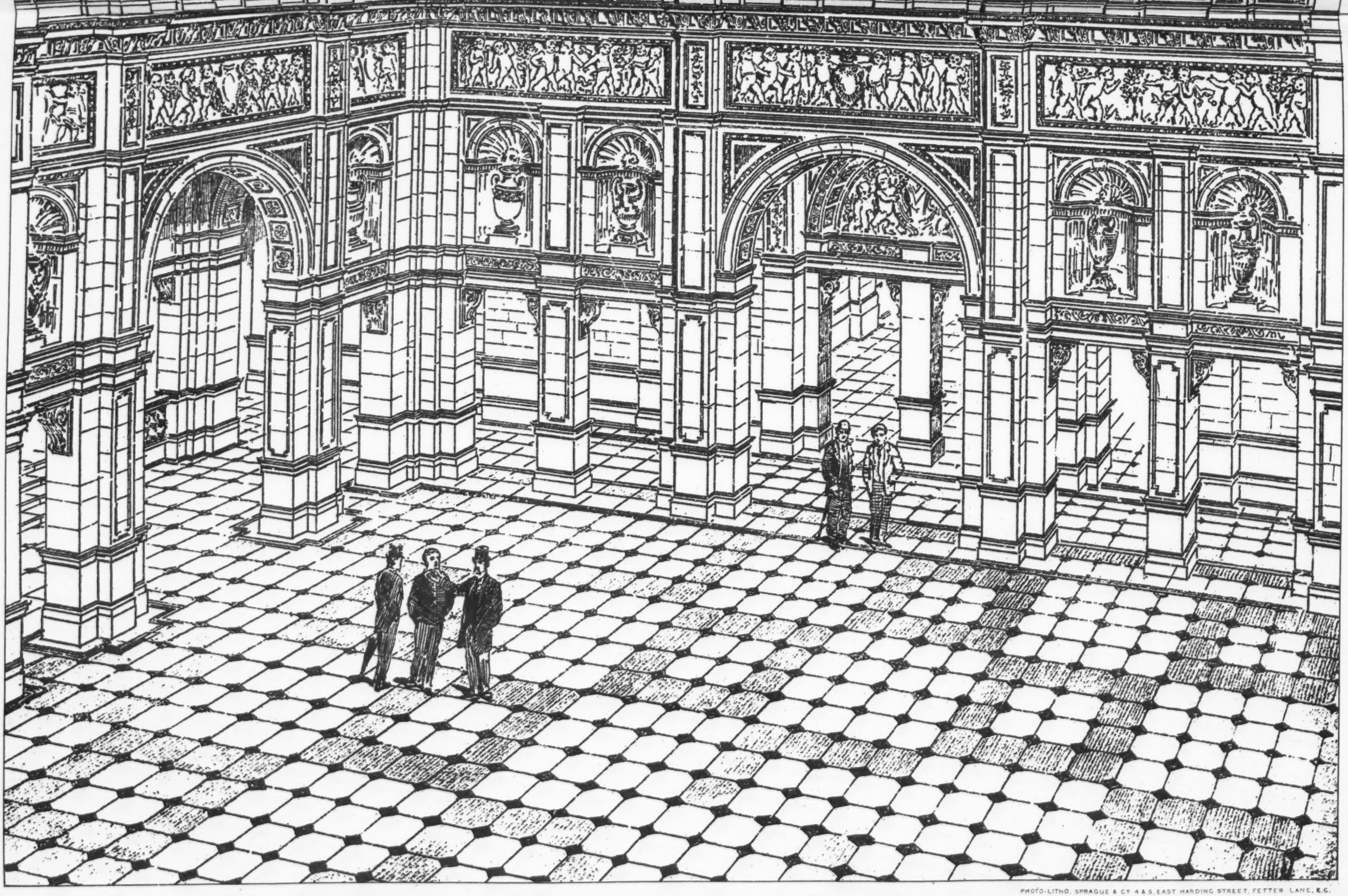


PHOTO-LITHO. SPRAGUE & Co 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

SOUTH KENSINGTON MUSEUM COMPETITION.—Design Submitted by Messrs. Deane & Son.

INTERIOR OF CENTRAL HALL.